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ABSTRACT

This Bibliography includes all of the items added to the Technical Information Center of the National Clearinghouse for Smoking and Health from January through December 1971. The publication is broken down into eleven major categories. These are: (1) chemistry, pharmacology and toxicology; (2) mortality and morbidity; (3) neoplastic diseases; (4) non-neoplastic respiratory diseases; (5) cardiovascular diseases; (6) other diseases and conditions; (7) behavioral and educational research; (8) tobacco economics; (9) bills and legislation; and (10) general references. Also included in this bibliography are a cumulative author and organizational index and a cumulative subject index. (BW)

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PREFACE

This *Bibliography* includes all of the items added to the Technical Information Center of the National Clearinghouse for Smoking and Health from January through December 1971. Earlier volumes still available for purchase through the Superintendent of Documents, Government Printing Office, include the volumes for 1968, 1969 (Parts I and II), and 1970. These may be ordered by requesting from the Government Printing Office, Public Health Service Publication No. 1124, Bibliography Series No. 45, plus the year desired.

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CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-0001. Anastasov, A., Mokhnachev, I.G. Sherstyanykh, N. A. **Izsledvane na Sustava na Alkaloidite v Tyutyuneviya Dim s Pomoshta na Gazovata Khromatografiya. [Investigation of the Alkaloid Composition in Tobacco Smoke by Gas Chromatography.]** *Bulgarski Tyutyun* 13(5):24-26, 1968, Bulgarian.

Gas chromatography was used to determine the composition of all basic constituents present in cigarette smoke, such as pyridine, *alpha*-picoline, and *beta*-picoline, with special attention given to the true alkaloids (nicotine, nornicotine, anabasine, metanicotine, etc.). The results are tabulated. A crepe filter reduced the nicotine content of the smoke by about 20 percent and the content of the other alkaloids from 20 to 57 percent. As far as the toxicity of nicotine and other alkaloids is concerned, such a filter on a cellulose base definitely renders smoking less hazardous.

71-0002. Anastasov, A., Pisklov, V. P., Mokhnachev, I. G. **Izsledvane na Parafinovite Vuglevodorodi v Glavnata Struya na Tyutyuneviya Dim s Pomoshtta na Gazovata Khromatografiya. [Investigation of the Paraffin Hydrocarbons in Main-Stream Tobacco Smoke by Gas Chromatography.]** *Bulgarski Tyutyun* 13(11):27-32, 1968, Bulgarian.

The peaks in the chromatogram disclosed that paraffin hydrocarbons containing 20 to 33 carbons, both straight and branched chain, were present in the smoke. Cellulose filters increased the average values from 2.37 to 2.64 mg of higher hydrocarbons per gram tobacco. This indicates that filters by their decomposition may cause a relative increase of approximately 10 percent in higher hydrocarbons. It was speculated, however, that the increase might be due not to filter decomposition but to hydrocarbons adsorbed in the filters and later released as smoking continued.

71-0003. Arsenyan, E. **Kolichestveni Izmeneniya na Alkaloidite pri Razlichni na Fermentatsiya na Orientalski Tyutyuni. [Quantitative Changes in the Alkaloid Content of Oriental Tobacco With Different Curing Processes.]** *Bulgarski Tyutyun* 13(11):22-26, 1968, Bulgarian.

The Bulgarian tobacco industry, aware of the health hazards of smoking and its consequences on the industry's economic survival, has tested several curing methods in an attempt to lower the nicotine content of Bulgarian-grown tobacco. These methods, including short, high-temperature curing, multi-step curing, and curing with various pauses, affect the enzyme activity and microorganisms present in the tobacco. The best results were obtained with the short, high-temperature cure, which reduced the alkaloid content by almost 10 percent.

71-0004. Artho, A., Koch, R. **Ueber den Gehalt des Cigarettenrauches an Acrolein und Cyanwasserstoff. [Acrolein and Hydrocyanic Acid Content in Cigarette Smoke.]** *Mitteilungen aus dem Gebeite der Lebenzmittelungtersuchung und Hygiene* 60(5):379-388, 1969, German.

The acrolein and hydrocyanic acid content of cigarette smoke has been studied. The measurement of acrolein was carried out directly by chromatography while hydrocyanic acid in the gas and particulate phases was determined by a colorimetric method. The hydrocyanic acid content retained in the butt was also measured. In the gas phase of the cigarettes without filters were found between 90 and 230 micrograms of acrolein per cigarette, depending on the kind of tobacco. The quantity of hydrocyanic acid found in main-stream smoke (gas and particulate phases) was between 150 and 350 micrograms per cigarette. It was further established that the two compounds are appreciably reduced by the utilization of filters containing the adsorbent materials.

71-0005. Banyai, A. L. **Ominous Mesalliance: Inhalation of Carbon Monoxide From Motor Vehicles and Cigarettes.** *Chest* 58(5):532, November 1970.

Animal and human experiments have shown that carbon monoxide can lead to increased pulmonary artery pressure, increased heart rate and systolic pressure, decreased metabolism, some myocardial fiber degeneration, hemorrhaging and necrosis of the myocardium, increased blood viscosity, atheromatous changes, ECG changes, inhibition of brain bioelectric activity, impairment of cognitive and psychomotor areas of the brain and inhibition of alveolar macrophage function. Carboxyhemoglobin levels reach 4 to 6 percent in moderate smokers and up to 12 percent in heavy smokers. Carbon monoxide concentrations from motor vehicle exhausts, especially during peak traffic hours, often exceed the maximum allowable levels.

71-0006. Baribaud, L., Yacoub, M., Faure, J., Malinas, Y., Cau, G. **L'Oxycarbonemie de l'Enfant Ne de Mere Fumeuse. [Carboxyhemoglobinemia in the Child Born to a Mother Who Smokes.]** *Medecine Legale et Dommage Corporel* 3(3):272-274, July-August-September, 1970, French.

While the average rate of carbon monoxide in nonsmoking women is 2.11 cm^3/1000 cm^3 of blood, and is 3.52 for their children, this rate increases in smoking mothers. Women who smoked from 11 to 20 cigarettes a day showed 11.67 cm^3 of carbon monoxide per 1000 cm^3 of blood, and their babies 15.13 cm^3 of carbon monoxide in the blood. This indicates that children born to smoking mothers show an almost chronic intoxication from carbon monoxide, which is present in tobacco smoke at 3.2 percent. Spontaneous abortions occurred in 11 out of 27 smoking mothers, as compared to 7 out of 50 nonsmoking mothers.

71-0007. Bastos, W. P., Ramos, A. O. **Isoaminile as Inhibitor of Muscarinic and Nicotinic Ganglionic Receptors.** *Pharmacology* 4(1):39-44, 1970.

The ganglioplegic action of isoaminile was observed in dogs and cats. The drug antagonizes both muscarinic and nicotinic ganglionic receptors in the superior cervical ganglion of the cat, the adrenal responses to splanchnic nerve stimulation, and the hypertensive action of nicotine, acetylcholine and McN-A-343 (4-(m-chlorphenylcarbamoiloxy)2-butynyltrimethylammonium chloride). (Auth. Abs. Mod.)

71-0008. Bianchi, C., Beani, L., Crema, C. **Effects of Metoclopramide on Isolated Guinea-Pig Colon. 2) Interference With Ganglionic Stimulant Drugs.** *European Journal of Pharmacology* 12(3):332-341, November 1970.

Possible effects of metoclopramide on intramural nervous structures of isolated guinea-pig distal colon were investigated to ascertain if stimulation produced by the drug on the gastrointestinal peristalsis depended on actions other than the demonstrated peripheral sensitization to acetylcholine. Nerve-mediated responses were obtained with nicotine and 5-hydroxytryptamine, which stimulated not only cholinergic neurons, but also non-cholinergic nervous structures in the presence of post-ganglionic cholinergic and adrenergic blockade. Metoclopramide enhanced the cholinergic responses to nicotine, but blocked the others. Conversely, the drug completely prevented the effects of 5-hydroxytryptamine. Since: (1) the stimulatory effect of nicotine on non-adrenergic, non-cholinergic structures was abolished during 5-hydroxytryptamine tachyphylaxis; (2) 5-hydroxytryptamine maintained its own effects during nicotine tachyphylaxis; (3) metoclopramide antagonized 5-hydroxytryptamine, it is suggested that the drug blocks tryptaminergic receptors, necessary for activating unknown nervous elements involved in the control of gastrointestinal tone and motility. (Auth. Abs.)

71-0009. Bolt, A.J.N., Clarke, R. E. **Cholesterol Glucoside in Tobacco.** *Phytochemistry* 9(4):819-822, April 1970.

The sterol and sterolin fractions of flue-cured tobacco have been investigated. It has been confirmed that the major components in the sterol fraction are stigmasterol, *beta*-sitosterol, campesterol and cholesterol and these compounds are present as their glucosides in the sterolin fraction. Cholesterol glucoside has not previously been reported in tobacco, nor in any other plant. (Auth. Abs.)

71-0010. Bush, L. P., Sims, J. L., Atkinson, W. O. **Volatile Nitrogenous Bases and Aliphatic Secondary Amines of Burley Tobacco.** *Canadian Journal of Plant Science* 50(3):289-294, May 1970.

Volatile nitrogenous bases and dimethylamine, methylethylamine, and diethylamine with N-methyl-n-propylamine were determined on two strains of burley tobacco isogenic for nornicotine. Concentrations of the nitrogenous bases and the secondary aliphatic amines, which are positively correlated with total nitrogen levels, were lower in leaves from the lower stalk positions. (Auth. Abs.)

71-0011. Clin, B., Lemanceau, B. **Etude par Resonance Magnetique Nucleaire d'Isomeres Cancerogenes et non Cancerogenes (Dibenzacridines et Dibenzanthracenes). [Study by Nuclear Magnetic Resonance of Carcinogenic and Non-Carcinogenic Isomers (Dibenzacridines and Dibenzanthracenes).]** *Comptes Rendus Herbdomadaires des Seances de l'Academie des Sciences; D: Sciences Naturelles* 271(9):788-790, August 31, 1970, French.

To add to the knowledge of carcinogenic elements in tobacco smoke, nuclear magnetic resonance studies were made of molecules of three dibenzacridine isomers, and of two dibenzanthracenes. Interpretation of these biochemical studies on the effects of solvents is very complex, although an attempt was made to separate normal from abnormal effects of carcinogens.

71-0012. Collins, P. F., Sarji, N. M., Lawrence, W. W., Williams, J. F. **An Automated Method for the Determination of Total Aldehydes in Gas Phase of Cigarette Smoke.** *Tobacco* 171(26):83-87, December 25, 1970.

A method for the determination of total aldehydes in the gas phase of cigarette smoke is described which is practical to use in the analysis of large numbers of cigarettes. The method provides a measure of the total aldehydes in the gas phase of cigarette smoke, and the results obtained agree well with the sum of acetaldehyde, propionaldehyde and acrolein found by gas chromatography. The method has been applied to various types of cigarettes with the relative standard deviation per port of 5 cigarettes ranging from 6 to 14 percent. (Auth. Abs. Mod.)

71-0013. Dempster, W. J. **Smoking and Frusemide Diuresis. (Letter)** *Lancet* 2(7674):661, September 26, 1970.

An intravenous injection of frusemide can abolish the antidiuretic effect of an injection of posterior pituitary extract, such as Infundin, and thus avoid subjecting experimental smokers to nausea and more accurately control the amount of antidiuretic hormone stimulation a given quantity of frusemide can inactivate.

71-0014. Drachev, T. **Vliyanie na Vlazhnostta i Temperaturata Vurkhu Nyakoi Khimicheski Sustavki na Tyutyun Virzhiniya pri Fermentatsiyata. [Effect of Moisture and Temperature on the Change of Some Chemical Components in the Virginia Tobacco Type During Fermentation.]** *Bulgarski Tyutyun* 13(5):27-32, 1968, Bulgarian.

Soluble carbohydrate, protein, nicotine, and ash content of 10 brands of cigarettes, with a moisture content of 12.1 and 14.7 percent, were determined at 40, 50 and 60°C. There was no observable difference if the fermentations were carried out at 40 or 50°C. A temperature increase to 60°C resulted in an insignificant drop in nicotine content.

71-0015. Duncan, M. E., Brookes, P. **The Relation of Metabolism to Macromolecular Binding of the Carcinogen Benzo(*a*)pyrene, by Mouse Embryo Cells in Cul-**

ture. *International Journal of Cancer* 6(3):496-505, November 15, 1970.

The metabolism of tritiated benzo(*a*)pyrene (B(*a*)P) by primary mouse embryo cells in culture was studied. At concentrations of B(*a*)P in the medium below about 2-3 millimicromoles/ml, metabolism was exponential with time, but at higher concentrations a period of rapid metabolism was followed by a progressive decline. The extent of binding of the hydrocarbon to DNA, RNA and protein was studied under the above conditions. It was found that at low doses of hydrocarbon the binding to macromolecules was proportional to the overall metabolism, with the result that the binding index, *i.e.* the amount of hydrocarbon bound divided by the amount metabolized, was constant. At higher dose levels, overall metabolism did increase with dose whereas macromolecular binding reached a plateau value. This resulted in a fall in the "binding index" below the constant value found at low doses of B(*a*)P. As a consequence of these results and those of other workers, a model scheme is proposed for the enzymic metabolism of B(*a*)P which accords with the known facts of metabolism and macromolecular binding. (Auth. Abs.)

71-0016. Gambhir, S. S., Das, P. K. **Effects of Acetylcholine and Carbachol on the Blood Vessels of the Frog.** *Quarterly Journal of Experimental and Cognate Medical Sciences* 55(4):313-319, October 1970.

The effects of a few cholinergic agents, especially acetylcholine and carbachol, were studied on the perfused systemic blood vessels of the frog. Nicotine, adrenaline, isoprenaline, papaverine and barium chloride were used as controls. Acetylcholine (ACh) and carbachol (CCh) were found to be potent vasoconstrictors, confirming the report of Rahman (1963) with ACh. The vasoconstrictor action of choline and pilocarpine was much weaker. The ACh action was only partially inhibited by pentolinium, but the actions of ACh as well as CCh remained unaffected by tolazoline, gallamine and d-tubocurarine. Atropine nearly completely blocked the vasoconstrictor responses of ACh and CCh though the skeletal muscle spasms caused by these choline esters remained unaffected. The results indicate that the nicotinic activity of ACh and CCh did not play any major role in the vasoconstrictor actions in frogs. Decrease in perfusion rate was also not due to spasms of skeletal or non-vascular smooth muscle. It appeared that the action is chiefly mediated through atropine sensitive receptors. (Auth. Abs.)

71-0017. Garofalo, P. **Avvelenamenti Accidentali Acuti Domiciliari da Vegetali. [Acute Accidental Poisoning at Home From Vegetables.]** *Minerva Pediatrica* 22(30):1545-1553, July 28, 1970, Italian.

In a general discussion of the various methods and causes of accidental poisoning in the home, particularly harmful to children, cigarettes are mentioned as one category. Two cases are described in which cigarette butts were accidentally ingested. In such cases nicotine, although known as an extremely dangerous poison, was not the principal cause. Rather, the noxious material which accumulated in the cigarette butt was the culprit which irritated the gastric mucous membranes due to the action of the tarry components.

71-0018. Georgiev, S. **Vliyanieto na Nabivkata na Tsigarite Vurkhu Khimicheskiya Sustav na Tyutyuneviya Dim. [Influence of the Density of Cigarettes on the Chemical Composition of the Smoke.]** *Bulgarski Tyutyun* 13(8/9):53-59, 1968, Bulgarian.

Cigarettes were selected so that the weights of the individual cigarettes in the various batches would not fluctuate by more than ±10 mg. Air was aspirated through the cigarettes at a rate of 17.5 ml/sec. The dry condensate, chloroform-soluble matter, nicotine, and phenols were determined. A denser packing did not significantly alter the values. It was hoped that the greater density and resulting greater draw effort would induce a certain amount of irritation (and cut down on the smoke and nicotine content) but this did not materialize. A denser cigarette with a longer butt, however, would offer some protection for the smoker since more toxic material would remain in the unsmoked portion of the cigarette.

71-0019. Grunwald, C., Davis, D. L., Bush, L. P. **Cholesterol in Cigarette Smoke Condensate.** *Journal of Agricultural and Food Chemistry* 19(1):138-139, January-February 1971.

Cholesterol, the prinicipal animal sterol, was found in cigarette smoke condensate both in free and bound form. The cholesterol identification was based on gas-liquid chromatography and mass spectrometry. This sterol accounted for 8.6 percent of the total sterol content in cigarette smoke condensate, of which about 52 percent was in the free form and 48 percent in the bound form. In cigarette tobacco, cholesterol accounted for 10 percent of the total sterols, of which 48 percent was in the free form and 52 percent in bound form. The transfer of free and bound cholesterol from cigarette tobacco to trapped condensate was about 13 percent while the total sterol transfer was 15 percent. (Auth. Abs.)

71-0020. Guerin, M., Chouroulinkov, I., Lazar, P. **Action Inhibitrice des Carcinogenes Chimiques sur les Mitoses Dans les Cultures de Cellules Pulmonaires de Rat. I. Etude du 3,4 Benzopyrene. [Inhibiting Action of Chemical Carcinogens on the Mitosis in the Cultures of Pulmonary Cells of Rats. I. Study of 3,4-Benzopyrene.]** *Comptes Rendus des Seances de la Societe de Biologie et de ses Filiales* 164(2):234-238, September 25, 1970, French.

Dosage with 3,4-benzopyrene results in almost complete inhibition of the mitotic coefficient. Where inhibition is not complete, it is sharply depressed in comparison with control cultures. The decrease in the mitotic coefficient is shown as a function of the dosage of 3,4-benzopyrene and is highly significant. The inhibition is believed due, not to the general toxicity of benzopyrene, but rather to its specific action on the mitotic cycle of the cell.

71-0021. Haebisch, H. **The Cigarette as a Source of Carbon Monoxide.** Translated from *Archiv fur Toxikologie* 26(3):251-267, August 26, 1970.

Complete English Translation of **70-1277.**

71-0022. Hamza, J., Ritli, I. **Hazai Gyartmanyu Cigarettak Kemiai Vizsgalata Kulonos Tekintettel as Utobbi Evekben Megjelent uj Gyartmanyokra. [Chemical Investigation on Domestic Cigarettes, Especially the Newest Products of the Past Year.]** *Dohanyipar* 17(2):72-74, March-April 1970, Hungarian.

The chemical properties of Hungarian cigarettes, a total of 82 separate products under 18 brand names, commercially available in the first half of 1969, are tabulated. Generally valid and standard methods were used in the testing. The Hungarian cigarettes were compared with foreign products.

71-0023. Harke, H.-P. **The Problem of "Passive Smoking".** Translated from *Munchener Medizinische Wochenschrift* 112(51):2328-2334, December 18, 1970.

The concentrations of carbon monoxide (CO) and nicotine were measured in ventilated and unventilated rooms under abnormal smoking conditions (42 cigarettes smoked within 16 to 18 minutes) and normal smoking conditions (11 cigarettes smoked within 5 hours). An average of 0.50 mg nicotine/m^3 and 48 ppm CO were measured under the abnormal conditions and 0.04 to 0.09 mg nicotine/m^3 and 10 ppm CO under normal conditions. The maximum allowable working place concentration values established for nicotine and CO (0.5 mg/cm^3 and 50 ppm) were exceeded in the smoking of cigars (9 cigars smoked within 30 to 35 minutes resulting in a maximum of 1.04 mg nicotine/m^3 and 60 ppm CO), were about equal under the abnormal conditions and were significantly below under the normal smoking conditions. In another study, carboxyhemoglobin and urine nicotine and cotinine values of subjects before and after smoking or passive smoking in ventilated and unventilated rooms were determined. The differences in these measured values between smokers and nonsmokers and between ventilated and unventilated rooms were significant. There were no significant differences between the values at different ventilations.

71-0024. Hess, H. **On "Passive Smoking."** Translated from *Literatur-Eildienst "Roche"* 37(7):49-52, 1969.

Tobacco smoke passively inhaled by the nonsmoker is predominantly side-stream smoke and in smoke-filled rooms, where nicotine concentrations may reach from 3.0 to 5.2 mg/m^3 of air, the nonsmoker inhales the equivalent of one cigarette hourly. The quantity of carbon monoxide formed in the combustion of 1 g of tobacco can fluctuate from 20 to 1000 cm^3, depending on the moisture content of the tobacco, the packing density, and the speed of smoking. The carboxyhemoglobin level in the blood of nonsmokers may reach 3 percent, while in smokers it can rise to 10 or even 15 percent. Nicotine, carbon monoxide and other possibly pathogenic constituents of tobacco smoke can so pollute the room air that even passive inhalation can result in the development of obliterating vascular diseases.

71-0025. Hooper, P. A., Schneider, R. **The Effects of "Autonomic Drugs" on Villous Movement in the Small Intestine of the Pigeon.** *British Journal of Pharmacology* 40(3):426-436, November 1970.

The responses of pigeon duodenal villi to intravenous injection or local application of "autonomic drugs" were studied and compared with those reported in dogs by other workers. Choline esters, anticholinesterases, noradrenaline, adrenaline and nicotine all stimulated villous movement in the pigeon. Similar responses to these drugs have been reported in the dog. The effects of these drugs on villous activity could be inhibited by pretreatment of the bird with suitable antagonists, although hexamethonium was ineffective in preventing the effects of nicotine. Some of the antagonists also stimulated the villi. Isoprenaline caused inhibition of villous movements, which could be prevented by pretreatment of the bird with propranolol. It appears that in pigeons the villi have both α-adrenoceptors, stimulation of which increases villous activity, and β-adrenoceptors, stimulation of which depresses villous movements. (Auth. Abs.)

71-0026. Lengyel, I. **Hazai Dohanyaink Kemiai Osszetetele. [Chemical Components of Domestic Tobaccos.]** *Dohanyipar* 17(2):78-80, March-April 1970, Hungarian.

A brief description is given of the chemical components (from the literature) which are of significance for the quality of the most important commercial varieties of tobacco. Published results of chemical analyses of the domestic varieties (Havesi, Burley, Kerti, Szabolcsi) are also given. There are references to the possibilities, with whose help, development of the chemical components of the tobacco can be influenced qualitatively.

71-0027. Leuner, H. **Die toxische Ekstase. [Toxic Ecstasy.]** *Bibliotheca Psychiatrica et Neurologica* 134:73-114, 1968, German.

States of ecstasy induced by using various toxic substances are discussed in detail. The so-called "magic plants" were originally used exclusively in connection with health treatments apparently because they were believed to possess supernatural powers. Active principles of the "magic plants" are chemical substances, many of which have now been identified. Administered to humans, they frequently cause severe changes in the psychic area, usually more marked than by administration of the plants themselves. The substances are called by various names today: hallucinogens, psychotics, psychotomimetics, phantastics, psychotoxins, psychodelic substances, or even mysticomimetics. The substances differ in the method of application: oral intake of plants or of extracts; percutaneous; use as salves, especially as "witches ointments" in the middle ages; and inhalation of the smoke of burned substances, or in modern application, intramuscular or intravenous injection. According to an old arrangement, the ecstasy states were distinguished as ecstasy through use of magic plants, smoke ecstasy, alcoholic ecstasy, and nicotine ecstasy. Tobacco smoking, alcohol consumption and use of hashish are discussed briefly.

71-0028. Mokhnachev, I. G., Pisklov, V. P., Anastasov, A. **Spektrofotometrichno Opredelyane na Benzo(*a*)pirena v Kondenzata na Tyutyuneviya Dim. [Spectrophotometric Determination of Benzo(*a*)pyrene in Tobacco Smoke Condensate.]** *Bulgarski Tyutyun* 13(8/9):26-30, 1968, Bulgarian.

A method was developed making use of extraction with nitromethane and adsorption on a column of silica gel, for removing materials showing absorption peaks similar to benzo(*a*)pyrene which could be determined spectrophotometrically. Paraffinic hydrocarbons could be determined simultaneously by the same method. A crepe filter permits a reduction of the benzo(*a*)pyrene content by about 10 percent but this is not sufficient to overcome the carcinogenic action of this compound.

71-0029. Montesano, R., Magee, P. N. **Metabolism of Dimethylnitrosamine by Human Liver Slices** *in Vitro. Nature* 228(5267):173-174, October 10, 1970.

An attempt was made to get indirect evidence of man's susceptibility to the carcinogenic action of nitrosamines by studying the metabolism of dimethylnitrosamine by human liver slices *in vitro*. Results showed that human liver can metabolize dimethylnitrosamine at a rate comparable with rat liver and the similar levels of nucleic acid methylation in the two species suggest that man may be about as sensitive as the rat to the carcinogenic action of this compound.

71-0030. Neurath, G. **Stickstoffverbindungen des Tabakrauches. [Nitrogen Compounds in Tobacco Smoke.]** *Beitraege zur Tabakforschung* 5(3):115-133, December 1969, German.

Knowledge of tobacco smoke composition grows rapidly by application of modern analytical methods. Hitherto, 181 nitrogen compounds are known comparable to 50 in 1959, comprising 24 aliphatic amines, 19 aromatic amines, 7 nonaromatic N-heterocyclic compounds, 26 pyridine bases, 6 other aromatic six-membered N-heterocyclic compounds, 2 pyrroles, 15 other aromatic five-membered N-heterocyclic compounds, 12 pyrazines, 16 tobacco alkaloids and compounds with two nitrogen rings, 15 amino acids, 16 nitriles, 6 nitroalkanes, some derivatives of nitrous acid, inorganic cyano compounds, nitrogen oxides, ammonia, and elemental nitrogen. The balance of all the nitrogen compounds in tobacco smoke condensate gives a hint at the occurrence of unknown neutral N-compounds. (Auth. Abs.)

71-0031. Obi, Y., Muramatsu, M., Shimada, Y., Sakurai, H. **Netsubunkai Kara Mita Tabako no Hinshitsu. V. K Atai Kosei Gasu Seibun to Kokitsumi Tokusei to no Sokan no Tokeiteki Kento. [Evaluation of Tobacco Quality From Pyrolytic Aspects. V. Statistical Study of Correlation Between Gaseous Constituents of Cigarette Smoke From Which the K Value Was Computed and Organoleptic Properties of Tobacco Smoke.]** *Nippon Senbai Kosha Chuo Kenkyusho Kenkyu Hokoku* 111:125-128, 1969, Japanese.

The statistical investigation of correlation between gaseous constitutents of cigarette smoke of K value and organoleptic properties of tobacco smoke showed that the K value is reasonable as quality coefficient for the evaluation of aroma and taste of cigarette smoke of flue cured tobacco. (Auth. Abs.)

71-0032. Ogg, C. L., Schultz, E. F. (Jr.). **Collaborative Study of the Determination of Tar and Nicotine in Cigarette Smoke.** *Journal of the Association of Analytical Chemists* 53(4):659-672, July 1970.

Ten laboratories participated in a 2-phase collaborative study of a method for tar and nicotine in cigarette smoke. In one phase, 200 monitor cigarettes were smoked, while in the second phase, 60 cigarettes from each of 5 pairs of samples were smoked over a period of 2 weeks according to a random port X sample design. A total of over 9000 measurements was reported for weight, number of puffs, total particulate matter, water, nicotine, and tar. Statistical analysis of the results showed the significant variables to be within- and among-laboratory differences and a laboratory X material interaction. Agreement between laboratories was good for cigarettes delivering less than 20 mg tar and 1 mg nicotine, but poor for samples with higher tar and nicotine deliveries. Further study of the method is recommended to improve its performance with cigarettes having high tar and nicotine deliveries. (Auth. Abs.)

71-0033. Peirone, S., Guarona, P. **Azione Della Nicotine su Cellule Coltivate** *In Vitro.* **[Action of Nicotine on Cells Cultured** *In Vitro.]* *Bolletino Della Societa Italiana di Biologia Sperimentale* 45(17):1146-1148, September 15, 1969, Italian.

Chicken embryo hearts were studied through *in vitro* culture in order to study the effect of nicotine on the cells. The cells showed stress within a few minutes of initiating the experiment, and stress increased with time, being most accentuated in the cell cytoplasm. Notable changes were seen in the chondrioma almost immediately upon contact, but not all the mitochondria were affected at the same time or to the same extent. However, the nucleus of the cell, within this experimental time limit, showed no remarkable alteration. All changes noted were reversible to a time limit up to three hours. After repeated washings, the cells recovered a normal aspect within six or seven hours. The disappearance of vacuoles was rapid and took place within one hour; reconstitution of the mitochondria was in the form of filaments.

71-0034. Philippin, C., Gilgen, A., Grandjean, E. **Etude Toxicologique et Physiologique de l'Acroleine Chez la Souris. [Toxicological and Physiological Investigation on Acrolein Inhalation in the Mouse.]** *Internationales Archiv fur Arbeitsmedizin* 26(4):281-305, November 17, 1970, French.

Acute and chronic effects of the inhalation of acrolein vapors were investigated in mice. The acute exposure lasted six hours. In the chronic exposures, each concentration was given six hours daily for two weeks. The effects on swimming performance, body weight and lethality were studied, and histological analysis of the lungs was carried out. Chronic exposure to 25 ppm of acrolein produced a significant slowing of swimming speed. Acute LD_{50} was found at a concentration of 66 ppm and chronic LD_{50} at a relatively wide dose range between 25 and 50 ppm. Repeated exposures to acrolein revealed no signs of a development of tolerance or sensitization. In the chronic exposures, body weight was significantly reduced with concentrations of 6 ppm or more. Histological analysis of the lungs revealed atelectasis, inflammatory responses with edema and, in two of 15 cases, dilatations of alveoles and bronchioles were seen. (Auth. Abs.)

71-0035. Scassellati Sforzolini, G., Savino, A. **Evaluation of a Rapid Index of Ambient Contamination by Cigarette Smoke, in Relation to the Composition of the Gas Phases of the Smoke.** Translated from *Rivista Italiana d'Igiene* January-April 1968.

Complete English Translation of **A-11372.**

71-0036. Scassellati Sforzolini, G., Saldi, G. **Further Research on the Polycyclic Hydrocarbons of Cigarette Smoke. Comparison of the Inhaled Smoked and That Taken From the Ambient Atmosphere.** Translated From *Bollettino Della Societa Italiana de Biologia Sperimentale* 37:769-771, 1961.

Complete English Translation of **A-05447.**

71-0037. Somasundaran, P. **Change in Gas Volume During Puffing of a Lit Cigarette.** *Tobacco* 171(25):15-20, December 18, 1970.

A knowledge of the change of gas volume during puffing is important for the analysis of the burning process of cigarettes and is required in the correlation of reverse smoking experiments (in which a positive pressure is used to force air through a cigarette) with conventional ones in which smoke is sucked from it. A sensitive and rapidly responding pressure transducer-oscilloscope combination was used to measure the rate at which air was entering the cigarette while smoke was sucked for two seconds at a constant rate of 16.57 cc/second. The volume change was an increase averaging 23 percent of the volume of entering air. During the first fraction of a second, there was a small decrease in the volume change followed by a steady increase. After completion of a two-second puff, the cigarette continued to produce gasses for about one third of a second, making the total volume change about 19 percent. If the supply of air to the glow cone is reduced prior to the puff, the volume increase is reduced. Literature reports that the volume change is zero might be due to such choking of the cigarette for a few seconds prior to the puff. (Auth. Abs.)

71-0038. Srch, M. **The Significance of Carbon Monoxide in Cigarette Smoke in Passenger Car Interiors.** Translated From *Deutsche Zeitschrift fur die Gesamte Gerichtliche Medizin* 60(3):80-89, 1967.

Complete English Translation of **D-07279.**

71-0039. Tamari, Y. **Jikasen Daeki Amylase Bumpitsu ni Taisuru Nicotine Sayo ni Tsuite. [Effect of Nicotine on Amylase Secretion by the Parotid Gland.]** *Folia Pharmacologica Japonica* 65(5):454-465, September 20, 1969, Japanese.

Nicotine (100-1000 micrograms/kg intravenous) increased the flow rate, protein content and induction of amylase in rabbit parotid gland saliva on electric stimulation of the auriculotemporal nerve. At doses of 300 micrograms/kg, the stimulating action of nicotine on protein content and amylase activity was not inhibited by phenoxybenzamine (8 mg/kg, administered 30 minutes previously), bretylium (10 mg/kg, 45 minutes previously) or by chronic denervation. Hexamethonium (2 mg/kg, 3 minutes previously), propranolol (0.3 mg/kg, 4 minutes previously) and adrenalectomy inhibited the action of nicotine on protein content and amylase activity. Propranolol, chronic denervation and adrenalectomy did not inhibit the stimulating action of nicotine on the flow rate. It was inhibited by hexamethonium, bretylium and phenoxybenzamine.

71-0040. Yacoub, M., Faure, J., Mallion, J.-M., Cau, G. **La Thiocyanaturie du Fumeur. [Thiocyanaturia of the Smoker.]** *Medecine Legale et Dommage Corporel* 3(3):266-270, July-August-September 1970, French.

The metabolism and urinary metabolites of thiocyanates in smokers are discussed. The toxicology of cyanogenic components of tobacco smoke and the presence of cyanohydric acid in smoke are reviewed. Urinalyses were made of 253 men, of whom 165 were smokers, and of 47 women, 22 of whom were smokers. Thiocyanates in the urine of nonsmokers was 4.5 mg/l and values rose as a function of age. In the case of smokers, thiocyanates in the urine rose to 14.5 mg/l. Various factors influenced the statistics in the case of smokers, such as number of cigarettes smoked, inhaling the smoke, age and occupation. Results prove that cyanides enter the organism through tobacco smoke.

71-0041. Yacoub, M., Faure, J., Mallion, J.-M., Cau, J. **Peut-on Determiner l'Origine Tabagique de l'Oxycarbonisme Chronique? [Can the Tobacco Origin of Chronic Carbon Monoxide Poisoning Be Determined?]** *Medecine Legale et Dommage Corporel* 3(3):262-265, July-August-September 1970, French.

To study carbon monoxide poisoning in relation to nicotine from tobacco smoke, research was done on 300 subjects, both smokers and nonsmokers of both sexes, and of varying age and occupations. The number of cigarettes smoked per day, the rate of carbon monoxide in the blood, and the amount of thiocyanates in the urine were determined. Carbon monoxide in the blood of 113 nonsmokers was 3.05 ml/l; thiocyanates excreted were 4.50 mg/l. Subjects smoking and inhaling smoke of 20 cigarettes showed 18.8 ml/l of carbon monoxide in the blood and excreted 19.4 mg/l of thiocyanates. Those smoking 20 cigarettes but not inhaling the smoke showed carbon monoxide in the blood at the rate of 12.1 ml/l, and excreted 16.3 mg/l of thiocyanates. According to the amount of thiocyanates excreted, it is possible to estimate the number of cigarettes smoked daily.

71-0042. Yazudzhiyan, E., Zhelazkov, D., Anastasov, A., Spasova, V. **Khimiko-Tekhnologicheska Kharakteristika na Tsigarite, Proizvezhdani v Stranite ot SIV. Suobshtenie. Tsigari, Proizvezhdani v SSSR, GDR i Polsha. [Chemical and Technological Characteristics of Cigarettes Produced in the Countries of the SIV. Report. Cigarettes**

Produced in the USSR, German Democratic Republic and Poland.] *Bulgarski Tyutyun* 13(8/9):47-52, 1968, Bulgarian.

Various physical and chemical values are tabulated for several brands of cigarettes produced in the USSR, Poland and the German Democratic Republic. In addition to length, mouthpiece width, weight and granulometric measurements, data are included on nicotine, tar, protein, sugar and paraffin content, internal resistance during aspiration and pure ash after combustion.

See also **71-0129**

MORTALITY AND MORBIDITY

71-0043. Coronary Drug Project Research Group. **The Coronary Drug Project. Initial Findings Leading to Modifications of Its Research Protocol.** *Journal of the American Medical Association* 214(7):1304-1313, November 16, 1970.

The Coronary Drug Project is a national collaborative study to evaluate long-term effects of 1) conjugated estrogens, 2.5 mg/day (ESG1); 2) conjugated estrogens, 5.0 mg/day (ESG2); 3) clofibrate, 1.8 g/day; 4) dextrothyroxine, 6.0 mg/day (DT4); and 5) niacin, 3.0 g/day compared with placebo for men aged 30 to 64 who have recovered from myocardial infarction (MI). From 1965 to 1969 8341 men were recruited and randomly assigned to the six groups. The ESG2 group experienced an excess number of events of nonfatal MI, pulmonary embolism and thrombophlebitis, compared with the placebo group. No overall trend towards a beneficial effect in reducing mortality was evident to outweigh these apparent adverse effects. Thirty-two percent of the 1119 men of the ESG2 group were smokers. The drug regimen was discontinued for all patients in this group. The ESG1 group did not show the apparent excess risk identified with the ESG2 group and is therefore continuing with the medication. A small subgroup of the DT4 group, those with frequent ectopic beats of ventricular origin on the resting ECG taken at baseline, experienced a higher mortality than 78 similar patients receiving placebo. Their medication was discontinued. No similar adverse effects were noted among other patients on this medication and they are continuing to receive the drug.

71-0044. Deleizhe, A., Reginster-Haneuse, G. **Incidences Medico-Sociales de l'Infarctus du Myocarde. [Medico-Social Incidence of Myocardial Infarct.]** *Archives Belges de Medecine Sociale, Hygiene, Medecine du Travail et Medecine Legale* 28(4):267-280, April 1970, French.

Medical and social factors influencing myocardial infarct were studied in 181 hospitalized patients and in 50 out-patients. Forty-two patients were smokers, and of this number 32 smoked more than one pack of cigarettes a day. On medical advice, 37 of these heart patients abstained entirely from using tobacco, and the others cut their consumption of tobacco by half. The frequency of heart attacks is much greater in men than in women and might possibly suggest that more men than women smoke.

71-0045. Godber, G. **O Preco do Maco de Cigarros: Cinco Anos de Vida. [The Price of a Pack of Cigarettes: Five years of Life.]** *Boletim do Instituto Portugues de Oncologia de Francisco Gentil* 37(8):6-9, August 1970, Portuguese.

After age 30, cancer of the lungs grows in importance as a cause of death, and research reveals that the majority of people affected are tobacco smokers. There has been no effective method yet evolved to dissuade youth from taking up smoking, since advertising of cigarettes is so much more prevalent than anti-smoking campaigns. Although nonsmokers throughout the world are the exception, physicians in Great Britain and the United States who smoke are in the minority. The cigarette is responsible for about 10 percent of the yearly deaths in England. Lost time from work, disability, and premature death are all caused by the cigarette.

71-0046. Goldsmith, J. R. **The New Airborne Disease. Community Air Pollution.** *California Medicine* 113(5):13-20, November 1970.

Photochemical air pollution of the California type involves newly defined atmospheric reactions, is due mostly to motor vehicle exhaust, is oxidizing, and produces ozone, plant damage, impairment of visibility and eye and respiratory symptoms. Aggravation of asthma, impairment of lung function among persons with chronic respiratory disease and a possible causal role, along with cigarette smoking in emphysema and chronic bronchitis, are some of the effects of photochemical pollution. More subtle effects of pollution include impairment of oxygen transport by the blood due to carbon monoxide and interference with porphyrin metabolism due to lead. Carbon monoxide exposures may affect survival of patients who are in hospitals because of myocardial infarction. During periods of carbon monoxide pollution cigarette smokers are likely to have higher carboxyhemoglobin levels than during non-polluted periods. Smokers also tend to have higher blood lead levels than nonsmokers because of the persisting residual effects of lead arsenate sprays used years ago where cigarette tobaccos are now grown. While many uncertainties in pollution-health relations need to be resolved, a large number of people in California have health impairment due to airborne disease of this new type. (Auth. Abs. Mod.)

71-0047. Haddow, A. J. **The Future and Lung Cancer.** *Health (London)* 7(2):23-25, Summer, 1970.

In the early 1940's, the incidence of lung cancer began to increase rapidly in males and coincided with the change in smoking habits from cigars and pipes to cigarettes. Although smoking in men is still increasing, in women it is increasing even more rapidly. If the present trend continues, they could reach the male mortality level in the next 20 years. The most important cause of lung cancer appears to be light Virginia-type tobacco, perhaps because it is so habitually inhaled. In Central American and Portugal heavy cigarette smoking does not lead to high lung cancer mortality rates. In these areas, a dark brown cigarette is smoked, the leaf being prepared in a manner similar to that of cigar tobacco. Recent World Health Organization studies of buccal carcinoma in relation to local tobacco chewing leave no doubt that a carcinogen is present in tobacco. All the evidence points to the fact that smokers of over 20 cigarettes per day have between 20 to 30 times as great a chance of dying from lung cancer as does the nonsmokers, and the exsmoker recovers much lost ground, but never quite reverts to the position of the nonsmoker. Recently, a substantial increase was found in the DNA content of the bronchial mucous membrane of smokers, and this increase slowly reverted to normal after smoking was stopped. Air pollution may play a part in the etiology of lung cancer, but it not considered an important one. Tobacco consumption continues to rise because of the failure of propaganda and education to convince people of the hazards of smoking, government apathy and the national revenue derived from the sale of tobacco products. The result is that more school children are becoming smokers, and as the latent period for lung cancer is from 15 to 20 years, these may be lung cancer cases by their thirties.

71-0048. Hakama, M. **Age-Adjustment of Incidence Rates in Cancer Epidemiology.** *Acta Pathologica et Microbiologica Scandinavica* (Section A, Supplement 213):1-47, 1970.

The problem of comparing disease frequency in different areas and in different population groups is considered. The most preferable comparisons are made by incidence rates of the disease. The rates have been adjusted to eliminate the confounding effects of concommitant variables, the most common of which is age. A parametric method for the problem of age adjustment is proposed and the biological basis of this procedure in the case of cancer is outlined. It is proposed that the Gaussian curve approximates the incidence curve for which the age specific incidence rates are discrete estimates. Information included in the specific rates cannot be replaced by a single index. The proposal that the probability of occurrence of a tumor by age has a normal distribution leads to three indices, maximum value, mean and standard deviation of the incidence curve, which specify cancer incidence by age. The three indices may be used as age-adjusted indices of incidence and for some forms of cancer a further reduction of adjusted indices is attained. The results are applied to four different primary sites of cancer. The model, Gaussian curve, adequately fits the age specific incidence rates of the four primary sites. The single index of incidence for stomach cancer is noninformative and misleading and the three estimates of parameters of the incidence curve are preferable in epidemiologic comparisons. In lung cancer, the method is directly applicable to the purposes of adjustment. This is even truer in regard to nervous system tumors. The proposed index of incidence is a function of the maximum value and standard deviation of incidence curve, and functionally independent from the mean age of incidence curve. However, the added information included in the index of incidence consists of the mean age of incidence curve. The correlation between smoking and lung cancer was somewhat higher when lung cancer was measured by the proposed index of incidence than when measured by the age-adjusted incidence rate, adjusted by direct method. The model is applied to support the hypothesis that breast cancer consists of two components of the disease, but available statistical methods are not accurate enough to estimate the indices of incidence of each component. The proposed index is limited and more work is needed to obtain reliable estimates of cancer incidence for epidemiologic purposes. (Auth. Abs. Mod.)

71-0049. Huttner, I., Huttner, H. **Die Motivation des Gesundheitsverhaltens. Teil I. [Motivation in Health Behavior. Part I.]** *Zeitschrift fur Aerztliche Fortbildung* 64(9):471-477, May 1, 1970, German.

Since the Nineteenth Century, health education has become the truly scientific principle of preventive medicine. Individuals have had to develop the corresponding drives and urges to remain healthy and be socially acceptable. They have had to learn to compensate for a reduced physical activity since labor-saving devices are on the increase. With a decreased physical activity, certain diseases, as for example, disorders of the respiratory tract, become more prevalent. One can overcome this high incidence of disease only by means of proper nutrition, a comprehensive program of physical training, and complete abstention from smoking. Abstention, in itself, is not a panacea. Other factors such as a higher education, limitation in family size, and a healthy family life, also contribute to the maintenance of health.

71-0050. Jaques, W. E. **Comparison of the Incidence and Site of Malignancies in Taipei, Taiwan and Little Rock, Arkansas.** *Journal of the Arkansas Medical Society* 67(4):135-137, September 1970.

Four hundred fifty consecutive post mortems on adult males were reviewed from Taipei, Taiwan, and Little Rock, Arkansas. The Taiwanese group showed a 46.6 percent incidence of malignancies while the Little Rock group accounted for only a 29.5 percent incidence. Primary liver cell carcinoma, squamous cell carcinoma of the esophagus, bronchiogenic carcinoma, leukemia and lymphoma, adenocarcinoma of the pancreas and nasopharyngeal carcinoma were the most frequent neoplasms encountered in the Taiwanese group. Leukemia and lymphomas, bronchiogenic carcinoma, adenocarcinoma of the pancreas and colon were the most common malignancies in Little Rock. Environmental factors are discussed as representing the differences in incidence and primary site of the neoplasms in the two groups. Particular attention is paid to the role of infectious hepatitis and its sequelae in the causation of hepatomas. The high incidence of nasopharyngeal, esophageal and gastric malignancies in the Taiwanese group is suggested to represent contact of the mucosae with carcinogens produced in the preparation of foods. The slightly lower incidence of lung cancer in Taiwan may be attributable to the less frequent smoking of cigarettes. (Auth. Abs. Mod.)

71-0051. Schoenberg, B. S., Bailar, J. C. (III), Fraumeni, J. F. (Jr.). **Certain Mortality Patterns of Esophageal Cancer in the United States, 1930-67.** *Journal of the National Cancer Institute* 46(1):63-73, January 1971.

Cancer of the esophagus shows substantial racial, geographic, and temporal variation within the United States. In a cohort analysis of mortality during 1930-67, the nonwhite population experienced steadily and rapidly increasing rates, while those of the white population remained relatively stable. The rising nonwhite mortality occurred at all ages and all areas of the country and was more pronounced among males than females. Death rates in the Northeast were consistently higher than in other regions of the country, with the geographic differential being more prominent among nonwhites (threefold) than among whites (twofold). Detailed analysis of the nonwhite statistics for 1950-66 showed that Negro males and females, together with Chinese and Japanese males, contributed to the excess in mortality. However, only Negroes had a steady increase in mortality over time. To study factors implicated in the origin of esophageal cancer, mortality rates by States for 1950-66 were compared with the following variable for each State: the percentage of population living in urban areas, *per capita* cigarette sales, and *per capita* alcohol sales. Mortality showed significant geographic correlations with each of these three variables, but the associations with cigarette and alcohol consumption seemed to result from some other, still unidentified, hazard in the urban environment. The striking racial variations in esophageal cancer suggest Negroes have been increasingly exposed, and are susceptible, to these carcinogenic influences. (Auth. Abs.)

See also **71-0055, 71-0059, 71-0073, 71-0124, 71-0174, 71-0182**

NEOPLASTIC DISEASES

71-0052. Campbell, A. H., Guilfoyle, P. **Pulmonary Tuberculosis, Isoniazid and Cancer.** *British Journal of Diseases of the Chest* 64(3):141-149, July 1970.

A group of 3064 tuberculous ex-servicemen experienced a significant excess mortality from all cancer (92 observed, 68 expected) during a 6-year period of observation. This was due to an increased mortality from lung cancer (33 observed, 16 expected) and carcinoma of the upper respiratory and digestive tracts (12 observed, 5 expected). A control group of ex-servicemen showed no increase of mortality from lung cancer, but did have a significant increase of mortality from carcinoma of the upper respiratory and digestive tracts. The administration of isoniazid was not found to increase the lung cancer mortality of the tuberculous patients. The excess mortality from lung cancer of the tuberculous group could not be attributed to a greater consumption of tobacco. Tuberculosis may have been a causal factor, increasing the lung cancer rate above that usually caused by the smoking habits of the group. The excess mortality from carcinoma of the upper respiratory and digestive tracts in both the tuberculous group and the controls were unexplained, but could have been related to excess alcohol consumption in both groups. Lung cancer mortality was greatest among the heavier smokers and least among the non-smokers. (Auth. Abs.)

71-0053. Chakravorty, R. C. **Smoking and Cancer of the Lung.** *Journal of the Indian Medical Association* 55(8):282-283, October 16, 1970.

A number of studies are reviewed which link cigarette smoking to human lung cancer in terms of increased lung cancer risk in smokers, type of lung cancer cell in smokers, respiratory epithelial changes in smokers, and the carcinogenicity of various chemical constituents and physical characteristics of tobacco smoke.

71-0054. Cole, P., Monson, R. R., Haning, H., Friedell, G. H. **Smoking and Cancer of the Lower Urinary Tract.** *New England Journal of Medicine* 284(3):129-134, January 21, 1971.

Interviews were conducted with 470 patients with transitional or squamous-cell carcinoma of the lower urinary tract, more than 90 percent of whom had a bladder tumor. An age-stratified and sex-stratified but otherwise random sample of 500 persons drawn from the population of the entire study area was also interviewed as a control. Among men, cigarette smokers have a relative risk of bladder cancer of 1.89 as compared with nonsmokers, and about 39 percent of the cases are related to smoking. This amounts to 16.4 cases per year per 100,000 men 20 years of age and over. Among women 20 years of age and over, the comparable figures are 2.00, 29 percent and 3.9 cases per year per 100,000. For both sexes risk is increased among those who smoked heavily and those who inhaled. None of the excess risk of bladder cancer associated with cigarette smoking is explained by any indirect association with occupational experience. No significant risk is associated with pipe or cigar smoking. The data also suggest that incidence rates will increase during the next decade or so,. especially among women. (Auth. Abs.)

71-0055. D'Alfonso, G. **La Caratterizzazione del Cancro Primitivo del Polmone. (Nota Epidemiologica.) [Nature of Primary Lung Cancer. (Epidemiological Note.)]** *Archivio di Tisiologia e Delle Malattie Dell'Apparato Respiratorio* 24(10):756-787, October 1969, Italian.

In an epidemiologic and statistical description of malignant neoplasms, tobacco use is mentioned as one of the exogenous factors of pulmonary oncogenesis. Statistics are presented on lung cancer related to cigarette smoking in 16 countries during the three-year period, 1963-65. The United States ranks third in mortality from lung cancer, with England and Wales, and Finland showing higher rates. A net decrease in lung cancer is illustrated from mortality data on physicians in England and Wales who gave up smoking, as compared to mortality rates of the general male population. A drop in mortality from lung cancer, as a function of time, is shown to be on the order of 20 percent for those who gave up smoking.

71-0056. Doll, R. **Cancer and Aging: The Epidemiological Evidence.** *Bulletin of the International Union Against Cancer* 8(2):15-16, August 1970.

Epidemiology has recently focused on the study of the relationship between aging and cancer. A 17-year study of bronchial carcinoma in 34,000 male doctors and their smoking habits showed that in both cigarette smokers and nonsmokers the incidence of the disease increases in proportion to the power of age, but it increases more rapidly in cigarette smokers (power of 7.5) than in nonsmokers (power of 4). However, the relationship between incidence and duration of exposure is the same for both groups. Taking a look at the effect of different doses, of changing the dose, and of stopping exposure, it was found that prolonged and continuous exposure to an agent such as cigarette smoke leads to an incidence of cancer that is proportional to a power of the duration of exposure. For this agent, the incidence at a given age is proportional to the daily dose. When exposure stops, the risk falls slightly and then rises parallel to that in nonsmokers; it follows that the effect of exposure must be to a large extent irreversible. Most epithelial cancers reveal a pattern similar to that for bronchial carcinoma in cigarette smokers. Analagous results from other studies suggest that age *per se* is not likely to be a factor, but that the progressive increase in incidence with age that is characteristic of many common tumors is the result of continuous and prolonged exposure to a carcinogenic agent.

71-0057. Doll, R. **Incidence du Cancer en Fonction de l'Age: Elements Epidemiologiques. [Incidence of Cancer as a Function of Age: Epidemiological Elements.]** *Medecine et Hygiene* 28(924):1110-1112, July 15, 1970, French.

Epidemiological considerations in cancer incidence are prefaced by general remarks on statistical methods and mathematical validity. The incidence of bronchial carcinomas in smokers is evaluated in the light of research done in Great Britain, Canada, and the United States. From data furnished by 34,000 resident British physicians, details were obtained on pulmonary cancer entered on death certificates. Results were analyzed in view of five variables: the way tobacco was smoked (pipe, cigar, cigarette); daily amount smoked; duration of smoking habit; age smoking started; and age tobacco habit stopped. From research in the United States, it was determined that the incidence of bronchial cancer in nonsmokers was only 6 out of 5,000 over a 16-year period. A mathematical formula is presented to show that prolonged exposure to a carcinogen such as cigarette smoke produces an incidence of cancer proportional to a power of the exposure time.

71-0058. Heermann, H., Rayes, A. R. **Zur Epidemiologie, Pathogenese, Geschlechtsverteilung, Strahlentherapie und Statistik des Larynx- und Hypopharynx-karzinoms. Erfahrungen an 1121 Fallen (1946-1969). [Epidemiology, Pathogenesis, Sex Distribution, Radiation Therapy and Statistics of Laryngeal and Hypopharyngeal Carcinomas. Experiences With 1121 Cases (1946-1969).]** *Zeitschrift fur Laryngologie, Rhinologie, Otologie und Ihre Grenzgebiete* 49(7):432-443, July 1970, German.

The epidemiology, pathogenesis, sex distribution changes in different age groups and radiation therapy in a series of 1125 laryngeal and hypopharyngeal carcinomas recorded between 1946 and 1969 are discussed. A connection between these carcinomas and cigarette smoking is probable.

71-0059. Koszarowski, T., Gadomska, H., Karewicz, Z. **Ocena Epidemiologiczna Zachorowan i Zgonow na Raka Pluca u Mieszkancow M.st. Warszawy w Latach 1963-1967. [Epidemiological Evaluation of the Incidence and Mortality Due to Pulmonary Carcinoma in the Population of the City of Warsaw in the Years 1963-1967.]** *Polskie Archiwum Medycyny Wewnetrznej* 45(3):451-459, September 1970, Polish.

In the last 50 years a striking rise was observed in the incidence and mortality due to pulmonary carcinoma in various countries. In Poland the highest indices of incidence and mortality due to pulmonary carcinoma appeared in large cities. In Warsaw the incidence of pulmonary carcinoma rose sixfold in the time period 1956-1967. From 1959 pulmonary carcinoma was the most frequent malignant neoplasm in men, before gastric carcinoma. In the years 1963-1967 pulmonary carcinoma accounted, of all reported neoplasms on the average, for 21.8 percent in men and for 4.4 percent in women. The incidence of this neoplasm accounted in men for 77.1 percent and in women for 22.9 percent of all pulmonary neoplasms, on the average (sex ratio = 3.9). Deaths due to pulmonary carcinoma constituted the greatest number of deaths due to all carcinomas, accounting, on the average, for 26.7 percent of all deaths due to neoplasms in men. Deaths due to pulmonary neoplasms were more frequent in men than in women. In the overall number of deaths due to pulmonary neoplasms men accounted for 79.1 percent of cases and women for 20.9 percent of cases, on the average (sex ratio = 4.4). The rise in the number of new cases and deaths due to pulmonary carcinoma is ascribed to various factors, cigarette smoking being the prime factor. (Auth. Abs. Mod.)

71-0060. Langvad, E., Zachariah, J., Pindborg, J. J. **Lactate Dehydrogenase Isoenzyme Patterns in Leukoplakia, Submucous Fibrosis and Carcinoma of the Oral Mucosa in South Indians.** *Acta Pathologica et Microbiologica Scandinavia* 78(5, Section A):509-515, 1970.

The lactate dehydrogenase isoenzyme pattern of biopsies from Indian oral leukoplakia, submucous fibrosis and carcinoma of the oral mucosa as well as that of oral mucous membrane biopsies from clinically normal Indian persons has been studied. The LDH_{IV}/LDH_{II} isoenzyme ratios found for leukoplakias, carcinomas and control biopsies did not differ significantly. The mean isoenzyme ratio of Indian control biopsies was significantly above that reported for Danish control biopsies. Submucous fibrosis was accompanied by a significant depression of the isoenzyme ratio. No clear correlation between LDH isoenzyme pattern and epithelial thickness was found. Smoking and chewing habits, which may be correlated with prevalence and localization of oral leukoplakias and carcinomas, did not significantly influence the isoenzymatic structure. Although final conclusions cannot be drawn, the high isoenzyme ratio of the Indian control material may represent an early precancerous condition, unrelated to smoking and chewing, preceding the histopathological manifestations of precancerous lesions. (Auth. Abs.)

71-0061. Mancuso, T. F. **Relation of Duration of Employment and Prior Respiratory Illness to Respiratory Cancer Among Beryllium Workers.** *Environmental Research* 3(3):251-275, July 19, 1970.

A prospective study was conducted of white males employed in 1937-1948 in the two major companies extracting beryllium and followed to 1967. The study showed a relationship of duration of employment with specific causes of death. Workers who were employed for one to five quarters (of a year) had a higher lung cancer rate than those employed for six quarters or more. A subcohort of beryllium workers with prior chemical respiratory illness, observed for the same period of time, revealed that six of the eight lung cancer patients (one to five quarters) had prior respiratory illness in the 1940-1948 cohorts, and five of the six lung cancers in age 35-44 (as of 1940) in these cohorts. There was a much higher rate per 100,000 for lung cancer among the subcohort of cases with prior respiratory illness than among the total cohort. The data indicates that prior chemical respiratory illness influences the subsequent development of lung cancer among beryllium workers. (Auth. Abs.)

71-0062. McEwen, J., Finlayson, A., Mair, A., Gibson, A.A.M. **Mesothelioma in Scotland.** *British Medical Journal* 4(5735):575-578, December 5, 1970.

In a retrospective study of the incidence of mesothelioma in Scotland for 1950-1967, 80 cases were traced from pathological reports and biopsy material of malignant tumors invading the pleura and peritoneum. These cases were matched with two sets of controls. Detailed histories of residence, occupation and degree of exposure to asbestos confirmed that the incidence of mesothelioma in Scotland is similar to that in other parts of Britain. A comparison of five categories of smoking habits among mesothelioma cases and controls showed a significant difference at the 1 percent level. (Auth. Abs. Mod.)

71-0063. Ochsner, A. **Relacion Entre el Habito de Fumar y el Cancer de Pulmon. [Relation Between the Habit of Smoking and Lung Cancer.]** *Prensa Medica Argentina* 57(25):1241-1243, August 21, 1970, Spanish.

A brief review is made of a few of the laboratory, prospective and retrospective studies conducted in the U. S. and Great Britain which have provided evidence of the relationship between lung cancer and cigarette smoking.

71-0064. Rodriguez Rivera, L., Achon Polhamus, M., Rodriguez Silva, H., De la Paz, E., Pita de la Vega, H., Durand Ochamendi, R., Sollet Guilarte, R. **Habito de Fumar y Diagnostico al Alta. Estudio de 453 Casos. [Analysis of the Smoking Habit in Discharged Patients. Study of 453 Cases.]** *Revista Cubana de Medicina* 8(6):561-567, December 31, 1969, Spanish.

Obstructive pulmonary emphysema is a frequent pathology among patients admitted to the Internal Medicine Service, and is considerably more frequent among cigarette smokers than among nonsmokers. The highest incidence of this disease was observed in patients who had been smoking for more than 30 years. In this study, all cases of pulmonary cancer occurred among smokers.

71-0065. Scassellati Sforzolini, G., Modolo, M. A. (Editors). **Il Fumo e la Salute. Guid Pratiche per l'Educazione Sanitaria. [Smoking and Health. Practical Guide for Health Education.]** Perugia, Italy, Centro Sperimentale per l'Educazione Sanitaria dell'Universita di Perugia, 1968, 32 pp., Italian.

Public health interest based on statistical and epidemiological studies, is directed toward morbidity and mortality due to tobacco smoking. Biological effects, chemical composition of the components of smoke from tobacco products, and socio-psychological factors are considered in relation to education dissuading people from smoking. Tables show the highest mortality from lung cancer in cities of over 50,000 population. As expected, both lung cancer and heart disease are highest in the population sector smoking more than 40 cigarettes a day. Other tables show the mortality from all causes, lung cancer, and heart disease. Compared with nonsmokers, smokers of over 20 cigarettes a day show a ratio of 110 to 12 deaths. Appended are descriptions of experiments showing the oxygen taken from the air by cigarette smoke, and an indication of the chemical components in tobacco smoke.

71-0066. Schmahl, D. **Experimentelle Untersuchungen zur Atiologie des Bronchialcarcinoms. [Experimental Research on the Etiology of Bronchial Carcinomas.]** *Internist* 11(9):300-302, September 1970, German.

Fluorescent measurement of exhaled cigarette smoke indicates that more than nine-tenths of fluorescent tobacco smoke components is retained in the lungs. Active and passive smoking experiments were made with laboratory animals and various results from literature are reviewed. Further research is needed in the area of more harmful effects from filter or filterless cigarettes. Mice and rats injected subcutaneously with tobacco condensation products developed local carcinomas. Experimental results from smoking machines with laboratory animals correlated satisfactorily with harmful effects of tobacco in humans, especially in the area of carcinoma development and respiratory difficulties. The arsenic component of tobacco smoke certainly leads to carcinoma development, but consideration must also be given to the accumulation effect also from the arsenic common to many insecticides.

71-0067. Shabad, L. M. **Review of Attempts to Induce Lung Cancer in Experimental Animals By Tobacco Smoke.** *Cancer* 27(1):51-54, January 1971.

Chemical-analytical and biological studies performed in the U.S.S.R. in recent years in the area of tobacco and air pollution carcinogenesis are reviewed. Studies attempting to induce lung cancer in laboratory animals are emphasized. Although there is still a lack of experimental data on animal models clarifying the relationship of lung cancer to cigarette smoking, these studies do indicate that cigarette smoke can induce lung cancer in animals.

71-0068. Shear, M. **South African Dental News.** *Dental Magazine* 87(3):130-132, June-July 1970.

A brief survey is made of some of the evidence implicating smoking as a major health hazard and was used to persuade the Dental Association of South Africa to adopt a resolution condemning the use of tobacco in any form.

71-0069. Soustin, V. P. **K Gistokhimicheskoy Kharakteristike Epiteliya Istinnykh Golosovykh Svyazok pri Individual'nom Razvitii Cheloveka. [The Histochemical Characteristics of the Epithelium of True Vocal Cords in the Individual Development of Man.]** *Vestnik Oto-Rino-Laringologii* 31:33-36, May-June 1969, Russian.

The author investigated 198 true vocal cords of man from the time of their origination to the age of 70 years. Subject to consideration was the age, sex and tobacco smoking in deceased persons. In the sections the author determined glycogen and neutral mucopolysaccharides after the Hochkiss-Shabadash method, acid mucopolysaccharides after Heil's technique, RNA after Brachet's, and keratin after Shubich's. Enzymatic and chemical controls (amylase, hyaluronidase, ribonuclease, acetylation) were carried out. The true vocal cords start to develop on the 6th-7th week of embryogenesis. At this period they are covered by multilayer nonciliary epithelium. Soon after origination opposite vocal cords grow together, while on the 8th-9th week of intrauterine life they separate. In 2½-4 months on the cords appear multilayer epithelium. Its cells synthesize at first glycogen and then mucopolysaccharides. With age the thickness of epithelium on the cords increases. It reaches the maximal thickness of 180 microns at a mature period of life. At this time the epithelium is characterized by a high content of RNA, glycogen and mucopolysaccharides. There is a distinct delineation of the layer into protective and reproductive zones. In a number of cases after 40 years in the epithelium of the man's cord there was established keratin synthesis. The epithelium on the male cord is thicker than on the female. The epithelial thickness on the smoker's cord reaches 300-350 microns, which is double that of nonsmokers. Such an epithelium as a rule cornifies. The epithelium of the medial and upper surfaces, as well as edges of the cord, are characterized by a specific structure and histochemistry. (Auth. Abs. Mod.)

71-0070. Tannenbaum, A. **Relatorio dos Trabalhos Sobre Inalacao de Cancerigeneos com Especial Referencia ao Fumo do Tabaco. [Report of Studies on the Inhalation of Carcinogens With Special Reference to Tobacco Smoke.]** *Boletim do Instituto Portugues de Oncologia de Francisco Gentil* 37(7):1-7, July 1970, Portuguese.

Experiments on animals and humans to determine the deleterious effect of carcinogenic tobacco smoke are reviewed. Tobacco smoke condensate was shown to be carcinogenic and sarcomagenic to animal tissues, especially in the respiratory tract. Since humans and animals differ anatomically, no conclusion can be drawn to the effect that a given agent may cause the same type of tumors in different species. Both retrospective and ongoing epidemiological studies indicate that tobacco smoke is a causal factor in cancer of the lungs and larynx. Studies using smoking machines with various animal species clearly attest to the carcinogenic effect of tobacco smoke.

71-0071. Vagoni, G. **Il Cancro del Polmone e l'Inquinamento Atmosferico da Industrializzazione. [Lung Cancer and Air Pollution Due to Industrialization.]** *Gazzetta Internazionale di Medicina e Chirurgia* 75(15):1160-1172, August 15, 1970. Italian.

A statistical survey of the variations in the incidence of lung cancer in different countries and in various regions of Italy, has been made. The more important factors which can have a bearing on the real increase in the incidence of this malady are discussed. Smoking, as a risk factor in certain types of lung cancer cannot be denied, but the author also emphasizes the role of air pollution as a carcinogenic factor. (Auth. Abs. Mod.)

71-0072. Wynder, E. L. **Etiological Aspects of Squamous Cancers of the Head and Neck.** *Journal of the American Medical Association* 215(3):452-453, January 18, 1971.

A very close association has been established between tobacco usage in any form and squamous cell cancer of the head and neck in nearly all sites. Cancer of the vocal cord, however, is predominantly related to cigarette smoking. While there is no evidence that alcohol is carcinogenic, it is suggested that alcohol either aids in the absorption of tobacco carcinogens, irritates tissues, or most likely, because of nutritional deficiencies related to heavy alcohol intake, makes squamous cells more susceptible to conversion into cancer cells. The etiological roles of syphilis and nutritional deficiences in squamous cell cancers of the head and neck are discussed. A recent study showed that the heavier a patient smokes before developing oral and upper respiratory tract cancers, the more likely he is to develop a second primary tumor; that continued smoking after the first primary tumor has a significant association with the occurrence of a second primary tumor; that continued drinking after initial diagnosis has no significant effect on the development of a second primary tumor; that discontinuance of smoking and drinking after the first primary cancer does not ensure that the patient will not develop a second primary cancer; and that radiation therapy for the first primary tumor appears to be associated with the development of a second primary tumor.

71-0073. Zenk, H. **Das berufsbedingte Kehlkopfkarzinom in gutachterlicher Sicht. [Occupational Laryngeal Carcinoma From the Viewpoint of Expert Testimony.]** *Zeitschrift fur Laryngologie, Rhinologie, Otologie und Ihre Grenzgebiete* 49(2):100-108, February 1970, German.

There is a statutory obligation in the East German Democratic Republic to observe and report on occupational carcinogenic factors causing cancer of the respiratory passages. Between 1957 and 1967 four cases of carcinoma of the larynx suspected of arising from exposure to noxious substances at work have been subjected to medico-legal scrutiny. It is surprising that in spite of the growing industrial expansion only one case has been recoginized as such. Medico-legal assessment of occupational laryngeal cancer requires an exhaustive history, histological reports, occupational health schedules and a detailed analysis of the work undertaken in the past. The toxic substances in question, their metabolites, as well as nicotine consumption are critically examined and the latent period considered. The individual case, rather than his occupational group, must be assessed in the light of changing chemical and physical conditions. As the occupational details generally available to the assessor tend to be insufficient, industrial medical documents usually need to be obtained. To facilitate the correct adjudication of individual cases it is desirable to establish a central register for reporting, working out, documenting and evaluating of such cases. The association between occupation and laryngeal cancer is still equivocal and we should therefore seek evidence of such association, irrespective of statistics, in the individual case of employment in suitable chemical works and also pursue the occupational factor, as far as possible by post mortem examination. Irrespective of individually identified carcinogens, suspect cases should be reported under a unified heading of cancers of the air passages due to occupational causes. (Auth. Abs.)

See also **71-0045, 71-0047, 71-0048, 71-0050, 71-0051**

NON-NEOPLASTIC RESPIRATORY DISEASES

71-0074. Addington, W. W., Carpenter, R. L., McCoy, J. F., Duncan, K. A., Mogg, K. **The Association of Cigarette Smoking With Respiratory Symptoms and Pulmonary Function in a Group of High School Students.** *Journal of the Oklahoma State Medical Association* 63(11):525-529, November 1970.

Cigarette smoking has been suggested to be causally related in the adult to chronic obstructive lung disease, but there is little data on the effects of cigarette smoking on teenagers. Five hundred fifty-seven out of 737 students of an Oklahoma City high school were surveyed for respiratory symptoms and their pulmonary functions measured. Despite the minimal and brief cigarette smoking reported by most students, significant differences were found between cigarette smokers and nonsmokers in the sample studied. Respiratory symptoms were significantly more frequent in the students who reported that they smoked cigarettes than in those who did not. No significant differences in pulmonary function were observed between cigarette smokers and nonsmokers. The data presented strongly suggest a prospective study of the relationship between cigarette smoking and chronic obstructive lung disease would need to begin with high school age subjects. (Auth. Abs.)

71-0075. Albert, R. E., Alessandro, D., Lippmann, M., Berger, J. **Long-Term Smoking in the Donkey.** *Archives of Environmental Health* 22(1):12-19, January 1971.

Three donkeys smoked 30 cigarettes two to three times per week for six to eight months. Two of the donkeys showed severe impairment of clearance during the entire period of smoking but with rapid and virtually complete recovery within a few weeks after the end of exposure. The third donkey also showed severe impairment for several months but developed a tolerance for cigarette smoke with a regression in the level of impairment to almost normal levels by the end of exposure. (Auth. Abs.)

71-0076. Bopp, K. Ph. **Pathogenese und Fruhdiagnostik der chronischen Bronchitis. [Pathogenesis and Early Diagnosis of Chronic Bronchitis.]** *Medizinische Klinik* 65(36):1598-1602, September 4, 1970, German.

The chronic bronchitis syndrome has exogenous causes (infection, mechanical damage, irritating gases, cigarette smoke, air pollution) and endogenous causes which are rare (hypogammaglobinemia and mucoviscidosis). The smoking habit alone can cause chronic bronchitis which is aggrevated if in combination with another causative agent of this syndrome. In workers who are continually exposed to chlorine gas, a slight incidence of chronic bronchitis is normal, but in habitual smokers, the bronchitis, once established, will be more severe and difficult to cure. In housewives, not industrially employed, the changes induced by chronic bronchitis will be more severe if they are smokers. While smoke from cigarettes may be lesser in magnitude than that emitted from smokestacks, nevertheless, cigarette smoke, due to its peculiar chemical composition, can be a worse offender with respect to the development of chronic bronchitis.

71-0077. Brille, D. **Frequence de la Bronchite Cronique Chez la Femme. Role du Tabac. [Frequency of Chronic Bronchitis in Women. Role of Tabacco.]** *Revue de Tuberculose et de Pneumologie* 33(6):794-797, 1969, French.

The increasing incidence of chronic bronchitis among women is cited, as based on a literature survey and personal experience. This fact is attributed to the increasing number of women who take up smoking, since formerly the ratio of women to men smoking was one to six. Generally, the frequency of sputum production in smoking women is greater than in men who have never smoked. It must be considered also that older women smoke, on the average, less than younger women. It is suspected that women over 50 years of age smoke less than 15 cigarettes a day, while men in the same age group are moderately heavy smokers.

71-0078. Brysiewicz, K., Buluk, H., Cesarz-Fronczyk, M., Kordecka, J., Leszczynski, B., Lukjan, Z., Sadokierska, H. **Wplyw Pracy w Warunkach Zapylenia na Czestosc Wystpowania Przewleklych Zapalen Oskrzeli u Pracownikow Zaklodow Przemyslu Welnianego Im. Sierzana w Bialymstoku. [The Effect of Occupational Dust Exposure on the Prevalence of Chronic Bronchitis Among Workmen of Sierzan's Wool Industry at Bialystok.]** *Gruzlica i Choroby Pluc* 38(7):657-661, 1970, Polish.

The noxious effects of dust exposure on chronic bronchitis were studied in 1047 wool industry workers at a factory in Bialystok, Poland. Manifestations of chronic bronchitis were found in 114 workmen (10.9 percent), 27 of whom also had advanced emphysema. In departments with dust concentrations over 10 mg/m^3, 16.6 to 30.0 percent of the workers had chronic bronchitis, while in departments with lower dust levels, bronchitis was found in 5.4 to 6.6 percent of the workmen. Dust concentration and duration of work were the most hazardous factors in relation to chronic bronchitis. The ratio of smokers to nonsmokers with chronic bronchitis was 3 to 2. An examination of 97 workmen with chronic bronchitis showed 45 percent with obstructive respiratory failure and 33 percent with ECG abnormalities. (Auth. Abs. Mod.)

71-0079. Cierniak, E., Jelonkiewicz, J., Slodczyk, M., Cierniak, J., Pawlak, F. **Przewlekle Zapalenie Oskrzeli Wsrod Pracownikow Zakladow Wlokienniczych. [Chronic Bronchitis in Textile Industry Workmen.]** *Gruzlica i Choroby Pluc* 38(7):635-641, 1970, Polish.

In a survey of 596 textile workers (310 women and 286 men) ages 36 to 64, 493 had been exposed to dust. Chronic bronchitis was diagnosed in 108 workers (simple chronic bronchitis in 58 and bronchitis with manifestations of airways obstruction in 50). The incidence was higher among men (24.1 percent) than among women (12.5 percent), and was related to the higher prevalence of smokers among the men. There was no difference between rural and urban populations. The proportion of cases of chronic bronchitis was 28 percent among smokers against 12 percent among nonsmokers, the difference being statistically significant. Exposure to dust had no significant effect on the incidence of chronic bronchitis (12 percent among those exposed to dust and 9 percent among those not exposed). (Auth. Abs. Mod.)

71-0080. Discher, D. P., Steinborn, J. **LS/MFT: Lung Screening by Meaningful Function Testing – Part II.** *American Journal of Public Health and the Nation's Health* 60(12):2361-2385, December 1970.

Linear equations for ventilatory functions have been used by the Breathmobile Project, based upon those given in the published literature. This report is an evaluation of these equations obtained on 2,200 persons considered to be "normal," each of whom had the six ventilatory measurements, were asymptomatic, and had never smoked. The six ventilatory parameters reported upon were as follows: the forced expiratory volume in the first second, the forced expiratory vital capacity, the peak flow, the maximal expiratory flow rate, the mid-maximal expiratory flow rate, and the ratio of the first two parameters. Four mathematical model types for ventilatory parameters were described, and an attempt was made to examine each type, using the data on the 810 males and the 1,390 females. It was concluded that there was insufficient evidence to justify using either of two polynomial model types. There appeared to be a certain amount of bias in the linear model. Effort is needed to develop a more refined model, taking into account both the error structure and a presumed focal age effect. A logarithmic model appeared to approach the former problem. The logarithmic equation type did have some *mathematical* justification based upon data given in this study, but the *epidemiologic* and *biologic* ramifications need to be explored. Further effort needs to be directed toward developing equations with a more appropriate attention to age. The six ventilatory parameters were found to lack independence as shown by partial correlation and pattern analyses. Moreover, combining the screening cutoffs on two of these parameters, as the Breathmobile Project is now doing, does have some methodologic defects. Therefore, a principal components analysis was initiated on this study group in an attempt to derive independent factors and overcome the methodologic shortcomings. With further study, we intend to evaluate it as a new tool for both screening programs and epidemiologic investigations. (Auth. Abs.)

71-0081. Dobrzynski, W., Kisielewicz, J., Kociecka, I. **Analiza Kliniczno-Statystyczna Przewleklych Niezytow Oskrzeli u Pracownikow Portu i Stoczni w Szczecinie. [Clinical and Statistical Analyses of Chronic Bronchitis in Port and Shipyard Workers.]** *Medycyna Pracy* 21(3):294-306, 1970, Polish.

Clinical examinations were made of 250 port and shipyard workers including 50 trimmers loading coal (Group I), 50 trimmers of products such as apatites, phosphorites, sulfur and cement (Group II), 50 corn elevator workers (Group III), 50 ship welders (Group IV) and 50 stevedores loading timber (Group V, control). An anamnesis, chest X-rays, spirographic examinations and pharmacological tests for latent bronchi contraction states were conducted. Chronic bronchitis was diagnosed in 140 persons, 101 with simple chronic bronchitis and 39 with chronic obstructive bronchitis. The main factor causing chronic bronchitis was cigarette smoking. Most of the cases and mostly chronic obstructive bronchitis were found among smokers. All cases of chronic bronchitis among the control group were also observed in smokers. Most cases of chronic bronchitis were found in workers exposed to dust. The incidence of bronchitis was 74 percent in Group II, 62 percent in Group IV, 60 percent in Group III and 48 percent in Group I. Evidence of the pathogenic effect of phosphorite, apatite, corn and welding dusts was seen in the significant percentage of nonsmokers with chronic bronchitis who had been exposed to these dusts. Latent bronchospasmatic states were observed in 137 workers. X-ray changes were observed in 172 persons and were the basis for diagnosing pneumoconiosis in 30 ship welders. Both X-ray changes and chronic bronchitis were noted in 102 persons. Radiological changes, latent bronchospasm and bronchitis were found in 89 workers and most often in ship welders, apatite trimmers and elevator workers. Among ship welders, chronic bronchitis occurred more often among younger men and men who had worked for shorter periods of time than in all the other groups.

71-0082. Dobrzynski, W., Kisielewicz, J., Kociecka, I. **Przewlekle Zapalenia Oskrzeli u Pracownikow Portowego Elewatora Zbozowego. [Chronic Bronchitis Among the Workmen of a Harbor Grain Elevator.]** *Gruzlica i Choroby Pluc* 38(7):651-656, 1970, Polish.

The following examinations were carried out in 152 workmen of a harbor grain elevator: past history according to the Medical Research Council's questionnaire on respiratory symptoms, roentgenographic, physical and spirographic examinations, and pharmacologic tests. The mean age of the examined workmen was 41 ± 5 years; the mean time of their employment was 10 ± 6 years. Chronic bronchitis was diagnosed in 72 workers (47.3 percent) of which 22 (14.5 percent) were cases with airways obstruction and 50 (32 percent) were cases of simple bronchitis. In 121 workers (79.5 percent) chest radiogram changes were seen in the form of linear L shadows or increased Z markings. Manifestations of chronic bronchitis were observed in 35 percent of the workmen employed for up to 6 years, in 51 percent of those working up to 11 years and in 74 percent of those working up to 16 years. Chronic bronchitis was found in 57 percent of smokers and in 18.3 percent of nonsmokers. The study demonstrates that a many-year exposure to grain dust predisposes to frequent inflammatory processes of the upper respiratory tract and to chronic bronchitis with spastic hyperreactivity of the bronchi. No distinct pneumoconiotic changes were observed. (Auth. Abs. Mod.)

71-0083. Durda, M., Szafranski, W., Smiech-Najda, B., Kosciolko, L. **Przewlekle Nieswoiste Choroby Pluc u Pracownikow Zakladow Elektromaszynowych "EDA" w Poniatowej. [Chronic Non-specific Lung Disease Among the Workmen of the Electro-Machine Works "EDA" at Poniatowa.]** *Gruzlica i Choroby Pluc* 38(7):623-634, 1970, Polish.

Data on age, sex, smoking habits, working conditions, and roentgenographic and spirographic findings were analyzed on 745 workers at an electro-machine works. The examined persons were divided into two groups: 1) 703 without any pulmonary lesions, and 2) 42 convalescents who had had pulmonary tuberculosis. Chronic non-specific lung diseases were found in 33.8 percent of the subjects in Group 1 and in 59.5 percent of the persons in Group 2. The prevalence was 40.9 percent in men and 17 percent in women. Cigarette smoking had a significant effect on the prevalence of chronic bronchitis, while dust exposure had a less detrimental effect. (Auth. Abs. Mod.)

71-0084. El-Sewefy, A. Z., Awad, S., Abdel-Salam, M. S. **Chest Symptomatology in an Egyptian Cement-Asbestos Pipe Factory (A Field Survey).** *Journal of the Egyptian Medical Association* 53(1):84-92, 1970.

This study was carried out in a plant for the manufacture of asbestos-cement pipes and salt glazed clay pipes. Three hundred and forty-seven workers out of a total of 600 were asked standard questions from the M.R.C. short questionnaire on respiratory symptoms (1960), examined clinically and their chest X-rayed. The results showed that there is a high incidence of respiratory signs and symptoms due to the high dust concentration in this plant. Smoking and aging have a very minimal effect on chest symptoms in comparison to the pathological effect of the dust produced by this firm. (Auth. Abs.)

71-0085. Fletcher, C. M. **Cigarettes and Respiratory Disease.** *Inhalation Therapy* 14(4):45-50, August 1969.

A broad review is made of the evidence supporting a causal relationship between cigarette smoking and chronic respiratory disease, particularly bronchitis and emphysema. This evidence includes findings of increased mortality rates from respiratory disease among smokers, and systematic development of certain symptoms in the syndrome of bronchitis and emphysema, including cough, profuse and often purulent sputum and increased airways obstruction, all of which have been found to be related to cigarette smoking. Additional causal evidence shows that: (1) in identical twins with different smoking habits, respiratory symptoms are more frequent and respiratory function is impaired in the heavier smoking member of each pair; (2) when smokers are matched in pairs with nonsmokers in relation to a large number of unconnected personal factors which should control most consitutional differences, the smokers retain a fifteen-fold excess mortality from emphysema; and (3) in animal experiments, cigarette smoke has induced severe bronchitis and caused destruction of the lung by emphysema. There is some indication that air pollution and chronic dust exposure can cause respiratory disease, but it seems that the adverse effects of these elements chiefly affect cigarette smokers.

71-0086. Greenberg, M., Milne, J. F., Watt, A. **Survey of Workers Exposed to Dusts Containing Derivatives of** *Bacillis Subtilis. British Medical Journal* 2(5710):629-633, June 13, 1970.

In a survey of 121 workers exposed to dusts containing derivatives of *Bacillus subtilis*, mainly proteolytic enzymes, skin tests showed evidence of sensitization in 48 workers. Sensitization was higher among "atopic" workers (showing one or more reactions to common allergens) – 16 out of 25 (64 percent) – than among "non-atopic" subjects – 32 out of 96 (33 percent). Of the 48 sensitized workers, 43 (90 percent) were smokers compared with 58 (80 percent) out of 73 non-sensitized workers. Reduced ventilatory capacity was found in 44 percent of sensitized workers compared with 14 percent of those not sensitized, but was not accounted for by smoking habits. (Auth. Abs. Mod.)

71-0087. Hawthorne, V. M., Gillis, C. R., Lorimer, A. R. **Multiphasic Screening Findings in Volunteers Examined at the Chest and Heart Association Health Exhibition in Glasgow.** *Medical Officer* 124(19):253-255, November 6, 1970.

Abnormalities detected in 523 of 3600 persons volunteering and keeping their appointment for multiphasic screening examination as part of a Chest and Heart Health Exhibition in Glasgow, Scotland are described. The group examined differed from samples drawn from industry routinely examined in this area, in that it contained more examinees with angina, fewer smokers, more with no remediable defects, fewer requiring preventive advice on smoking, and more requiring referral to the family doctor or hospital with established early clinical abnormalities. These results suggest that a higher proportion of the sample were more conscious of their health and were possibly attempting to pursue a healthier mode of living.

71-0088. Jordeczka, S., Basa, S., Basa, B. **Czestosc Wystepowania Przewleklej Nieswoistej Choroby Oskrzelowo-Plucnej u Pracownikow Przemyslu Welnianego. [The Prevalence of Chronic Non-specific Bronchopulmonary Disease in Wool Industry Workmen.]** *Gruzlica i Choroby Pluc* 38(7):643-650, 1970, Polish.

Symptoms of chronic non-specific bronchopulmonary disease were found in 145 (18.1 percent) out of 800 wool industry workers. In the age groups under 40, chronic non-specific bronchopulmonary disease was found in 32 (5.8 percent) out of 548 persons examined, while in the age groups over 40, the disease was present in 113 (44.9 percent) out of 252 workers examined. There was a significant difference in the incidence of the disease between smokers and nonsmokers and also between workmen employed for more than 15 years and those employed for less than 5 years. (Auth. Abs. Mod.)

71-0089. Lourenco, R. V., Castellanos, D. **Lung Tissue Hysteresis in Pulmonary Tuberculosis.** *American Review of Respiratory Disease* 103(1):49-56, January 1971.

Lung hysteresis and compliance, and pulmonary and airway resistances were measured in 16 patients (14 smokers, 2 nonsmokers) with pulmonary tuberculosis. For this purpose, tidal volume, air flow, transpulmonary pressure measured with an esophageal catheter, and transairway pressure obtained in a constant volume body plethysmograph were depicted simultaneously on two cathode ray oscilloscopes. The results were correlated with the clinical symptoms and radiologic extent of the disease and were compared with data obtained by the same methods in 11 normal subjects. Lung tissue hysteresis was significantly greater than normal in patients with pulmonary tuberculosis, and its value was related to the extent of the lesion present and to the severity of dyspnea. Lung compliance, although significantly less than normal, was not as greatly altered as hysteresis. Airway resistance was not different from normal. Abnormally increased lung tissue hysteresis with or without simultaneous decrease in pulmonary compliance might play a role in the symptoms of patients with regional lung diseases such as pulmonary tuberculosis. (Auth Abs. Mod.)

71-0090. Morris, J. F., Koski, A., Johnson, L. C. **Spirometric Standards for Healthy Nonsmoking Adults.** *American Review of Respiratory Disease* 103(1):57-67, January 1971.

Previous studies designed to establish normal standards for ventilatory testing have usually included substantial numbers of cigarette smokers and hospital patients. Forced expiratory flows and volumes were measured in 988 healthy nonsmoking men and women who had relatively little exposure to any form of air pollution. Negative correlations were obtained with age and positive correlations with height. Prediction formulas were derived and nomograms were constructed for 4 standard ventilatory measurements. Comparison were made with prediction formulas of other workers. There was progressive decline in ventilatory function with age; larger values in men were present at all ages. Wide variation was encountered and was not attributable to age, sex, or height. This was most marked in the two forced expiratory flows, which had low multiple correlations and large standard errors of estimate. The wide range of normal values seriously impairs the usefulness of spirometry in reliably detecting impairment of ventilatory function in asymptomatic individuals. Other techniques are needed to detect early impairment of pulmonary function. (Auth. Abs.)

71-0091. Naeye, R. L., Mahon, J. K., Dellinger, W. S. **Effects of Smoking on Lung Structure of Appalachian Coal Workers.** *Archives of Environmental Health* 22(2):190-193, February 1971.

A quantitative, morphologic study was undertaken of postmortem heart and lung structure on 144 Appalachian underground coal workers. Thirty-two had a lifetime history of nonsmoking, 24 smoked a pipe or cigars, and 88 smoked cigarettes in various amounts. There was no influence of smoking on the primary coal dust macule and its direct complications but the bituminous-coal miners who smoked had a 17 to 33 percent greater degree of cor pulmonale, 9 to 25 percent more emphysema, and 56 to 68 percent more bronchiolar goblet cells as evidence of chronic bronchiolitis than nonsmoking bituminous-coal miners. No significant effect of smoking on lung and heart structure was found in anthracite miners. (Auth. Abs.)

71-0092. Neri, L. C., Mandel, J. S., O'Connor, M. L., Larson, M. **A Household Survey of Chronic Methodological Problems and Results of Pilot Survey.** *Canadian Journal of Public Health* 61(5):407-412, September-October 1970.

A household survey is to be conducted in the Ottawa area to estimate the prevalence of chronic obstructive pulmonary disease and to relate this to smoking habits, air pollution and other measurable variables in the environment. Results of a pilot survey and its implications for modifying and carrying out plans for the main survey are reported.

71-0093. Spindletop Research, Inc. **Synopsis of the Work Session Proceedings. September 10-12, 1969. International Conference on CWP.** Spindletop Research, Inc., Lexington, Kentucky, 1969, 34 pp.
34 pp.

A conference on coal workers' pneumoconiosis was held to consider present knowledge of the medical aspects of this disease to summarize points of agreement concerning certain key questions, and to formulate recommendations for further research with regard to problems where no agreement could be reached because of conflicting or inadequate data. Surveys have shown that miners smoke as much as the nonmining population, but their smoking patterns differ somewhat because of work restrictions on smoking. Cigarette smoking has not been shown to be related to coal workers' pneumonconiosis, but it is highly related to respiratory symptoms, including cough, sputum, breathlessness on exertion, and to various laboratory indices of ventilatory function. In a study where a relationship between duration of dust exposure and pulmonary function was shown, division of the population into smokers and nonsmokers showed that this relationship was stronger for smokers. Thus, it is possible that cigarette smoking potentiates the effects of dust on pulmonary function, although smoking by itself is more important in the production of respiratory disease than exposure to coal mine dust.

71-0094. Pezzana, A., Scordamaglia, R. **Controllo Dello Stato di Salute del Personale di un Ospedale Generale Provinciale. [Control of the State of Health of Personnel of a General Provincial Hospital.]** *Giornale di Igiene e Medicina Preventiva* 10(4):493-507, September-November 1969, Italian.

The state of health of 296 people from the staff of a General Provincial Hospital has been checked. Numerous cases of chronic affections of the respiratory system were detected, which are thought to be due to smoking habit; moreover, several cases of rheumatic valvular defects, 7 of which are still asymptomatic and unknown to the subjects concerned, were ascertained. (Auth. Abs. Mod.)

71-0095. Pudelski, J. **Czestosc Zaburzen Wentylacyjnych Typu Obturacyjnego u Chorych na Swieza i Przewlekla Gruzlice Pluc. [Prevalence of Airways Obstruction in Patients With Recent and Chronic Pulmonary Tuberculosis.]** *Gruzlica i Choroby Pluc* 38(7):595-604, 1970, Polish.

Spirographic examinations, including vital capacity, one second forced expiratory volume (FEV_1) and maximal voluntary ventilation, were conducted in 830 patients with recent infiltrative or infiltrative with cavity tuberculosis, and in 179 patients with chronic pulmonary tuberculosis of over two year's duration. The ages of the patients ranged from 18 to 70. Ventilatory disturbances in the form of airways obstruction (FEV_1 less than 70 percent) were found in 26.5 percent of patients with recent pulmonary tuberculosis (31 percent of men and 17 percent of women). Considerable airways obstruction (FEV_1 under 50 percent) was found in 2.1 percent. The incidence of airways obstruction increased with the age of the patients. Dust exposure at work and smoking habits had a significant effect on airways obstruction in the men. Airways obstruction was found in 59 percent of patients with chronic tuberculosis and was not dependent on their sex. In 16.2 percent of these patients, the airways obstruction was considerable (FEV_1 less than 50 percent). The incidence of airways obstruction increased with the age of the patients, but was frequently found in the 30 to 40 age group. The extent of pulmonary lesions or smoking habit had no effect on the incidence of airways obstruction, while the duration of the illness had a definite effect in men. (Auth. Abs. Mod.)

71-0096. Reichel, G., Ulmer, W. T., Ikonomides, S. Z. **Einflusse der Rauchergewohnheiten auf die Haufigkeit unspezifischer Atemwegserkrankungen. III. Mitteilung. [Influence of Smoking Habits on the Incidence of Nonspecific Respiratory Diseases. III. Communication.]** *Internationales Archiv fur Arbeitsmedizin* 27(1/2):49-72, October 30, 1970, German.

Close relations, statistically still to be secured, have been found between duration and severity of smoking and frequency of cough and expectoration in 8,162 men and women examined. Strong smokers, men and women, generally complained two to three times more often about cough and expectoration in the daytime or in the morning than non-smokers. The influence of smoking habits on frequency of cough or expectoration showed to be as strong as that of age. Functional changes developing in dependence on smoking habits are characterized by a slight reduction of the arterial oxygen-pressure and rise of the alveoloarterial carbon-dioxide pressure difference. The findings suggest that severe smoking leads to an increased inhomogenity of the ventilation-perfusion and ventilation-diffusion relationship in the lungs. Considering the frequency of obstructive bronchial diseases, severity and duration of smoking do not seem to have the assumed importance. This results among other things from the fact that the generally less smoking women show just as often obstructive bronchial diseases as the more strongly smoking men. (Auth. Abs.)

71-0097. Sadoul, P., Laxenaire, M. C., Lambert, H. **Tableau Fonctionnel de l'Emphyseme Radiologiquement Destructif. [Functional Picture of Radiologically Destructive Emphysema.]** *Journal Francais de Medecine et Chirurgie Thoraciques* 24(2):183-204, February-March 1970, French.

The 32 cases had the following features: Clinically, bronchitic and radiological symptoms were preceded by dyspnea on exertion, there was distension of the lung areas, retention of air in forced expiration, disappearance of subsegmental vascular nets, which leads to further precisions on the real and radiologically certain concept of generalized emphysema. Twenty-two were heavy smokers; only one was a nonsmoker. Three out of four were underweight, by recognized standards. In 25 percent of the cases, the MEVS/VC is over 70 percent. Total capacity, as measured by dilution of helium is above the theoretical value for the CECA in one half of the number of patients. The total capacity for helium is always below the total capacity as measured on the NB films. Ventilation energy is about three times the normal energy, whereas basic ventilation compliance has not been significantly above normal in 13 patients with emphysema. CO and CO_2 ductance, AV/V, are notably lowered. Arterial blood gases, coefficient of take-in stable system, are less troubled than in severely breathless bronchitics. Hypercapnia is rare; hypoxhemia is discrete but grows with exertion. Hematocrit is seldom higher. Average of cardiac output is less than with bronchitics. Pulmonary artery blood pressure is very seldom high at rest. Evolution has been watched for 12 months to 5 years in 21 patients, for some days to 12 months in the other 11. Twelve died, and only three died of severe respiratory failure with hypercapnia. In three instances, death was more or less directly related to treatment by corticoids. Five sudden deaths were recorded. Auth. Abs. Mod.)

71-0098. Sufrin, M. **To Screen or Not to Screen for COPD.** *Bulletin National Tuberculosis and Respiratory Disease Association* 56(9):11-13, October 1970.

Cigarettes, air pollution and in one form of emphysema a genetic defect have been firmly linked to chronic obstructive pulmonary disease. The incidence is rising rapidly and as an element in its control, screening projects of varying scope and aim have been undertaken. The discussion explains why screening is useful for research and as part of general health examinations and why it is not recommended for case finding alone or for education of the general public.

71-0099. Teculescu, D., Stanescu, D., Gavrilescu, N. **Compliance Pulmonaire des Silicotiques a Spirographie Normale. [Pulmonary Compliance in Patients With Silicosis and Normal Spirographic Values.]** *Internationales Archiv fur Arbeitsmedizin* 26:250-262, 1970, French.

In 30 patients with silicosis, some abnormalities of static lung volumes and mechanics of breathing were found despite normal spirographic performance. Although $FEV_{1.0}$/VC was within normal limits, several subjects had hyperinflation and an increase in difference between static and dynamic lung compliance. The static lung compliance showed a wide scatter; however, seven patients (three from among the five patients with advanced silicosis) had a compliance under the lower normal limit, while a further four had "borderline" low values. In interpreting the physiologic abnormalities of the lung in patients with silicosis, the influence of age and smoking habits must be taken into account, but it was not thought that the consumption of tobacco, by itself, could explain the distensions found in these cases. (Auth. Abs. Mod.)

71-0100. Teculescu, D. B., Stanescu, D. C. **Pulmonary Function in Workers With Chronic Exposure to Cadmium Oxide Fumes.** *Internationales Archiv fur Arbeitsmedizin* 26(4):335-345, November 17, 1970.

Detailed pulmonary function studies were carried out on 11 workers (8 smokers, 1 ex-smoker and 2 nonsmokers) of middle age, who had been exposed for 7 to 11 years to moderate concentrations of cadmium oxide. Minor abnormalities of lung volumes, intrapulmonary mixing and lung compliance were found in a few cases; no airway obstruction was present. The lung diffusing capacity and the blood gases were normal. The chest roentgenogram showed a normal vascular pattern at the periphery of the lung. It is concluded that emphysema was absent in the group studied. (Auth. Abs. Mod.)

71-0101. Teculescu, D., Stanescu, D. **Ventilatia si Mixica Pulmonara la Barbati Tineri Sanatosi, Fumatori si Nefumatori. [Pulmonary Ventilation and Distribution in Young Healthy Males, Smokers and Nonsmokers.]** *Studii si Cercetari de Medicina Interna* 11(5):419-423, 1970, Rumanian.

The ventilation at rest, oxygen consumption, ventilation equivalent for oxygen, breathing frequency, mixing time and mixing ventilation have been determined in 44 young (mean age 21 years) healthy males in the sitting position. No significant difference for all these parameters was found between smokers and nonsmokers, and the data were pooled for the calculation of normal values. It is concluded that the smoking habit does not impair pulmonary ventilation and mixing in asymptomatic smokers in the third decade. (Auth. Abs.)

71-0102. Tremonti, L. P. **Tokyo - Yokohama Asthma.** *Annals of Allergy* 28(12):590-595, December 1970.

In 31 cases of Tokyo-Yokohama asthma, clinical features of chronic airway obstruction and the association with cigarette smoking have remained unchanged from previous reports. Because of the association of asthma to air pollution and the high incidence of blood and sputum eosinophilia, a hypersensitivity or allergic mechanism has been postulated as to the etiology of Tokyo-Yokohama asthma. (Auth. Abs.)

71-0103. Ulmer, W. T., Reichel, G. **Zur Epidemiologie der chronischen Bronchitis und deren Zusammenhang mit der Luftverschmutzung. [The Epidemiology of Chronic Bronchitis and Its Relationship to Air Pollution.]** *Deutsche Medizinische Wochenschrift* 95(51):2549-2553, December 18, 1970, German.

An epidemiological study on the prevalence of chronic bronchitis in 8162 persons demonstrated that ordinary chronic bronchitis (with cough and expectoration) markedly increases with increasing age. To a large extent it depends on smoking habits. Significant differences were not found in the prevalence between urban areas of the Ruhr, some of them with severe air pollution, a small town and a rural district. Obstruction bronchitis is much less common than simple bronchitis. The number of patients requiring intensive treatment is still rather high at 3 percent; the prevalence of all forms of respiratory tract obstruction rises from 3 to over 14 percent with increasing age. Smoking is a causal factor in the severe forms of obstructive bronchitis. But obstructive bronchitis increases in relationship to age also in nonsmokers. There was no correlation between general air pollution and the prevalence of respiratory-tract obstruction. Simple bronchitis occurs more frequently in men than women, but respiratory-tract obstruction has the same prevalence in the two sexes. Whether air pollution plays a role in the course of chronic obstructive bronchitis remains as a moot point. (Auth. Abs.)

71-0104. Woolf, C. R., Suero, J. T. **The Respiratory Effects of Regular Cigarette Smoking in Women.** *American Review of Respiratory Disease* 103(1):26-37, January 1971.

Clinical examinations, pulmonary function tests, and cytologic examinations of sputum were performed on 298 normal women between the ages of 25 years and 54 years. There were 97 nonsmokers, 30 ex-smokers, 24 light smokers, 63 moderate smokers, and 84 heavy smokers. With increase in cigarette smoking the prevalence of cough, sputum production, wheezing, and shortness of breath increased progressively. Abnormalities on physical examination of the chest were found more frequently in smokers than in nonsmokers. Sputum specimens were more frequently available from smokers than from nonsmokers. No malignant cells were found. Metaplasia of epithelial squamous cells and degenerative and "irritative" changes in columnar cells were found more in smokers than nonsmokers, but the differences were not significant. The results of the following pulmonary function tests were significantly lower in smokers than in nonsmokers: forced vital capacity, forced expiratory volume in one second, maximal midexpiratory flow, arterialized capillary blood oxygen tension at rest, specific conductance, and pulmonary diffusing capacity and fractional uptake of carbon monoxide during exercise. Hematocrit was higher in smokers than in nonsmokers. (Auth. Abs.)

See also **71-0034, 71-0052, 71-0064, 71-0136, 71-0146, 71-0152**

CARDIOVASCULAR DISEASES

71-0105. Abel, H., Schonberger, W., Schimmer, G. **Die Grosse der raumlichen T-Flachenvektoren unter Hypoxiebedingungen. [The Size of the Spatial T-Area Vectors Under Hypoxia.]** *Zeitschrift fur Kreislaufforschung* 59(7):599-604, July 1970, German.

Using the *Frank*-system we examined in 15 young healthy persons (8 smokers, 7 nonsmokers) the dependence of the spatial T-area vector on heart rate. The registration of the ECG was made first breathing normal air, second under hypoxia with 12 percent O_2 in N_2, and third in 4 persons under hypoxia with 16 percent O_2 in N_2. The smokers showed in hypoxia with 12 percent O_2 curves like patients with coronary insufficiency. The transit zone of the nonsmokers shifted to the region of low heart rate. The spatial T-area vectors of all persons became remarkably smaller. There were intermediate positions in the 4 persons, with hypoxia of 16 percent O_2. It is possible to calculate the degree of coronary insufficiency by these curves and therefore also the efficiency of the therapeutic effort. (Auth. Abs.)

71-0106. Auerbach, O., Hammond, E. C., Garfinkel, L., Kirman, D. **Thickness of Walls of Myocardial Arterioles in Relation to Smoking and Age.** *Archives of Environmental Health* 22(1):20-27, January 1971.

Three studies were made of the thickness of myocardium arteriole walls in relation to smoking and age. One was done on men at autopsy. Two were done on beagle dogs. In men, the thickness of arteriole walls was greater, on the average, in smokers than nonsmokers and increased with age. Thickness of arteriole walls increased with number of cigarettes smoked per day. The thickness was less, on the average, among cigar and pipe smokers than cigarette smokers. In two experiments beagle dogs daily inhaled cigarette smoke through tracheostomae; other were not exposed. The arteriole walls became thicker in smoking dogs than in nonsmoking dogs; thicker in dogs smoking fewer cigarettes; thicker in dogs smoking nonfilter cigarettes than in dogs smoking filter-tip cigarettes. The thickness of arteriole walls increased with duration of smoking. (Auth Abs.)

71-0107. Bahrmann, E. **Die Angina pectoris im Aspekt ihrer Korrelation mit biologischer Disposition, psychologischen und Soziologischen Einflussfaktoren. [Angina Pectoris in Relation to Its Correlation With Biological Predisposition, and Psychological and Sociological Influences.]** *Deutsche Gesundheitswesen* 25(22):1050-1051, May 28, 1970, German.

The harmful effects of nicotine from tobacco smoke are reviewed with special reference to biological predisposition in humans. A smoker of 20 cigarettes daily undergoes the same effect in increased blood pressure and pulse rate as a person doing strenuous physical exercise. Pathological findings are similar to those of coronary sclerosis. Morbidity and mortality statistics that are higher for smokers than for nonsmokers are reviewed. In smokers, morbidity results most frequently from coronary sclerosis, lung cancer, chronic bronchitis, and atherosclerosis of the lower extremities. Other statistics indicate that 85 percent of deaths from all causes involve habitual smokers. In another statistical sampling, the ratio of deaths from causes not attributed precisely to smoking was 23 percent for heavy smokers, and 13 percent for nonsmokers.

71-0108. Barrillon, A. **Comment s'Opposer au Developpement de l'Atherosclerose Coronarienne. [How to Prevent the Development of Coronary Atherosclerosis.]** *Entretiens de Bichat, Therapeutique* 1970, pp. 19-22, French.

In France, coronary atherosclerosis as a cause of death is increasing by about 13 percent a year, and is striking younger people. From epidemiological studies it was found that one predisposing condition for this illness is tobacco smoking. The relationship between coronary atherosclerosis and obliterating atherosclerosis, especially of the lower extremities, is even more pronounced. Coronary disease between 39 and 49 years of age is three times higher in heavy smokers; between 50 and 59 years of age this risk is doubled.

71-0109. Bertrand, E., Aye, H., Beda, B., Barabe, P., Lebras, M., Delloue, M. **Quelques Aspects des Coronaropathies Observees a Abidjan Chez des Noirs Africains. [Some Aspects of Coronary Disease in Black Africans Observed in Abidjan.]** *Archives des Maladies du Coeur et des Vaisseaux* 63(10):1445-1459, October 1970, French.

The authors are initiating a study of comparative medicine between Negroes and Europeans concerning coronary artery diseases. In the group of 25 patients with clinical and electrocardiographic coronary artery disease, this disease was found in 0.18 percent of the black males and 17.2 percent of the European males hospitalized. The black patients' etiological and pathological factors as compared to those observed in other coronary populations shows the black candidate to coronary disease in Abidjan is a man in the 4th or the 5th decade, with a higher than average economic status, of Nigerian nationality, often a smoker, with rather high blood cholesterol and fat rates. But he is rarely obese. Two patients only had cardiac failure with discovery of coronary electrocardiographic patterns. Thirteen patients only had electrocardiographic signs combined or revealed by another disease, particularly arterial hypertension. The functional character of these coronary insufficiencies is discussed. The symptoms are not very dissimilar, except for the less dramatic pains and more common lateral localizations in the ECG. The relative rarity of coronary disease in the black may be explained by the lesser incidence of atherosclerosis, or rather of thrombosis. The environmental factors in the traditional rural surroundings (lower life expectancy, lower economic status, diet and life habits) caused this rarity. (Auth. Abs.)

71-0110. Bierenbaum, M. L., Fleischman, A. I., Green, D. P., Raichelson, R. I., Hayton, T., Watson, P. B., Caldwell, A. B. **The 5-Year Experience of Modified Fat Diets on Younger Men With Coronary Heart Disease.** *Circulation* 42(5):943-952, November 1970.

A total of 100 men, 30 to 50 years old, with documented coronary artery disease and past myocardial infarction were placed under dietary management with a 28 percent fat diet. One hundred men whose diets were not managed were matched with regard to age at entry to the study, age at infarction, number of infarctions, blood pressure level, degree of angina, and serum cholesterol level among other factors. Over a period of 5 years the diet-managed group experienced and maintained a significant reduction in serum cholesterol level which the nondiet-managed group did not. Under the diet and experimental conditions employed, with saturated fat content below 9 percent of calories, and cholesterol intake below 400 mg per day, the degree of unsaturation of the fats in the experimental diets did not appear to influence serum cholesterol value or mortality. The serum triglyceride level was significantly lower in the diet-managed group than in the nondiet-managed group; this was presumably related to weight reduction. In the group under dietary management, fatal and nonfatal myocardial reinfarction rates were lower but were significantly so only for the fatal infarction rates in men under age 45. In the diet-managed group, smokers had a reinfarction incidence rate twice that of nonsmokers while there were no evident differences between smokers and nonsmokers in the nondiet-managed group. Serum phospholipids above 220 mg/100 ml were associated with a significantly lower rate of recurrent infarction. (Auth. Abs. Mod.)

71-0111. Buchanan, J. **Ballistocardiographic Smoking Tests in Myxoedema.** In: Ballistocardiography and Cardiovascular Therapy. Proceedings of the 2nd World Congress on Ballistocardiography and Cardiovascular Dynamics, Oporto, Portugal, 1969. *Bibliotheca Cardiologica; Supplementa ad Cardiologia* 26:89-93, 1970.

Positive ballistocardiographic smoking tests occurred in 16 of 19 patients aged under 40 years with coronary disease but of 18 hypothyroid patients of similar age only one had a positive test. No positive tests occurred in 11 patients euthyroid after treatment of myxedema nor in 27 apparently healthy subjects. These results do not support the view that myxedema causes significant coronary atherosclerosis. (Auth. Abs.)

71-0112. Bychkova, I. P. **O Giperplasticheskikh Izmeneniyakh Voloknistykh Struktur v Stenke Aorty Krolika pri Razvitii Eksperimental'nogo Ateroskleroza. [Hyperplastic Changes in the Fibrous Structure of the Walls of the Aorta of Rabbits During the Development of Experimental Atherosclerosis.]** *Kardiologiia* 10(3):144-147, March 1970, Russian.

Hyperplastic changes of the fibers of connective tissue of the intima of rabbit aorta continued, for the second time, immediately upon lowering of the lipid level. Formation of the fibrous elements appears to be connected with the activity of the smooth muscle cells, penetrating the inner membrane of the aorta of the subintimal layer of the middle membrane. Formation of the fine collagenous fibers are connected with the accumulation of chondroitin sulfate A and/or C and hyaluronic acid. Solid collagenous fibers also contain chondroitin sulfate B.

71-0113. Chang, C. H. **Hupyun i Tongmaek Kaenghwazung e Michinun Yunghyang e Kwanhan Yunkyu. I. Hupyun i Jungsangin Maekbak Hyulap Mit Pibu Ondo e Michinun Yunghyang e Kwanhayu. [Studies of the Smoking Effect on the Atherosclerotic Changes of the Arteries. I. Smoking Effect on the Pulse Rate, Blood Pressure and Skin Temperature in Normal Subjects.]** *Korean Journal of Internal Medicine* 13(7):485-491, July 1970, Korean.

The effects of smoking on the cardiovascular system were studied by measuring pulse rate, blood pressure and skin temperature before and after smoking. Following smoking there was an increase in pulse rate per minute ranging from 4 to 23 (10.5 average), an increase in systolic blood pressure ranging from 4 to 22 mm Hg (12.37 mm Hg average)and an increase in diastolic blood pressure ranging from 4 to 17 mm Hg (8.97 mm Hg average). Skin temperature of the finger dropped 1.2° to 5° C (2.68° C average), while toe temperature decreased 1.2° to 6.2°C (3.61° average). (Auth. Abs. Mod.)

71-0114. Cloarec, M. **L'Infarctus du Myocarde Chez l'Adulte Jeune (Moins de 40 Ans). [Myocardial Infarct in the Young Adult (Under 40 Years).]** *Entretiens de Bichat, Medecine et Biologie* 1970, pp. 153-156, French.

A longitudinal study was made of 32 adults under age 40 who suffered from myocardial infarct and various parameters were compared with a control group of the same age. Factors considered were diet, somatic state, tobacco and/or alcohol addiction, and psychiatric examinations. Twenty-one patients consumed twice the amount of alcohol as the average amount consumed by the control group. The greatest difference between the groups was alcohol and tobacco consumption. Of the ill patients, 30 smoked more than 20 cigarettes a day; 28 of the 30 inhaled the smoke. The most frequent associated condition was duodenal ulcer found in 10 cases, and in 9 of these cases it had preceded the coronary malady by an average of 7 years.

CARDIOVASCULAR DISEASES

71-0115. Coffman, J. D. **Tobacco Smoking and the Peripheral Circulation.** *Heart Bulletin* 19(5):89-93, September-October 1970.

Tobacco smoking or nicotine injection causes cutaneous vasoconstriction, an increase in skeletal muscle blood flow, and a decrease in venous distensibility. The cutaneous vasoconstriction is mediated via the sympathetic nervous system; the mechanisms of action on the skeletal muscle blood vessels and the veins are, as yet, unknown. Tobacco has not been established as the actual etiological agent in peripheral vascular disease but tobacco smoking can be dangerous, since it may decrease skin blood flow in an extremity with an already compromised circulation. The incidence of amputation in patients with arteriosclerosis obliterans is substantially greater in those who continue to smoke than in patients who stop smoking. (Auth. Abs.)

71-0116. Cohen, S. I., Dorion, G., Goldsmith, J. R., Permutt, S. **Carbon Monoxide Uptake by Inspectors at a United States-Mexico Border Station.** *Archives of Environmental Health* 22(1):47-54, January 1971.

Collection of expired-air carbon monoxide (CO) samples was utilized to examine inspectors on the United States-Mexican border to determine if significant increases in carboxyhemoglobin (COHb) occur. Twenty-six border inspectors were categorized as to smoking habits and work shift CO exposures. Employees not actively engaged in car inspection duties constituted the control group. Following shifts when particularly high ambient CO levels persisted, significant increases in COHb were noted in both smokers and nonsmokers. Controls did not exhibit significant alterations in COHb levels. The hazards of such COHb elevations to exposed individuals are discussed in light of recent evidence of a lack of threshold for cardiovascular and central nervous system effects. (Auth. Abs.)

71-0117. Cohen, S. I., Perkins, N. M., Ury, H. K., Goldsmith, J. R. **Carbon Monoxide Uptake in Cigarette Smoking.** *Archives of Environmental Health* 22(1):55-60, January 1971.

A study was carried out to determine whether smoking (1) regular, (2) low-nicotine-low-tar, or (3) non-tobacco (lettuce leaf) cigarettes has a differential effect upon an individual's carboxyhemoglobin (COHb) level. Each subject in the study population participated twice in five "smoking treatments" in which they smoked various tobacco and nontobacco cigarettes. Expired-air carbon monoxide (CO) samples were taken four times daily to estimate COHb concentrations. Results indicate that different cigarette preparations do not result in significant variation in a subject's COHb level. There was a significant difference, however, in COHb between individual smokers. It may be that differences in inhalation practices or factors such as pulmonary function are of some importance in determining whether an individual achieves low, moderate, or high COHb levels while smoking. (Auth. Abs.)

71-0118. Concours Medical. **La Cigarette, le Sucre ou les Boissons Chaudes? [Cigarettes, Sugar or Hot Drinks?]** *Concours Medical* 92(34/36):6457, September 5, 1970, French.

Theory was advanced on the association of sugar consumption and the incidence of myocardial infarcts and peripherial artery diseases. There seemed to be a direct relationship between sugar consumption and cigarette smoking. This relationship was further strengthened by research which indicated that heavy cigarette smokers usually consumed hot liquids with sugar, and this association of disease-causative factors is independent of other variables such as age and social status. The preponderance of evidence cites cigarette smoking rather than sugar as the causative factor of these diseases.

71-0119. De Molo, G. **L'Incidenza dei Fattori di Rischio Coronarico nei Soggetti con Infarto del Miocardio. [Incidence of Coronary Risk Factors in Subjects With Myocardial Infarct.]** *Annali di Medicina Navale* 75(3):243-258, May-June 1970, Italian.

An analytical study has been made on 386 cases of acute myocardial infarct in order to assess the statistical frequency of the so-called "coronary risk factors". Ninety-one percent of the men and 23 percent of the women were smokers. The influence of tobacco as a risk factor is discussed briefly. The author emphasizes that in the present study, the association of hypertension with high levels of blood cholesterol and diabetes was present in the majority of the cases. (Auth. Abs. Mod.)

71-0120. Elmfeldt, D. **Rokning och Koronarsjukdom (8): Rokvanor hos Patienter med Hjartinfarkt. [Smoking and Coronary Disease (8): Smoking Habits of Patients with Heart Infarctions.]** *Lakartidningen* 67(2):168-169, January 7, 1970, Swedish.

A statistical evaluation was made of current smokers, ex-smokers forced to discontinue the habit due to coronary disease, and nonsmokers. The patients were grouped according to the type of tobacco products consumed and the intensity of their smoking habits. The prognosis for the smokers was unfavorable and it was urged that patients suffering myocardial infarct abstain from smoking.

71-0121. Facchini, G., Tabarroni, F., Semeraso, S., Cremonini, G. P. **Influenza del Fumo di Sigaretta Sulla Prova di Sensibilita' all'Eparina "In Vivo" Studiata con Metodo Tromboelastografico. [Influence of Cigarette Smoke on the "In Vivo" Sensitivity-to-Heparin Test, Studied by the Thromboelastographic Method.]** *Archivio di Medicina Interna* 20(6):1113-1118, November-December 1968, Italian.

The thrombophilic effect of cigarette smoke is manifested in antagonizing the anticoagulant influence of heparin administered intravenously to 15 healthy, normocoagulant subjects. The thromboelastogram shows a minor lengthening of the reaction time (r) and formation of coagulum time (K), and a minor reduction of the maximum amplitude induced by a dosage of 0.35 mg of heparin/kg, after smoking a cigarette. Such an effect, theoretically, could be an epiphenomenon of the catecholamine response to the smoke.

71-0122. Fodor, J. **Rokning och Koronarsjukdom (4): Pragstudien. [Smoking and Coronary Disease (4): The**

Prague Study.] *Lakartidningen* 67(2):150-152, January 7, 1970, Swedish.

In 1963, the Institute for Cardiovascular Research in Prague investigated the smoking histories of all the inhabitants ages 60 to 64 years in one section of the city. The study included a record of angina pectoris, ECG changes and myocardial infarct. The data showed that cigarette smoking favored the development of myocardial infarct. Approximately 20 percent of the cigarette smokers suffered from intermittent claudication.

71-0123. Gutierrez, M. T., Dayrit, C. **Some Physico-Chemical Characteristics of Acute Myocardial Infarction Among Manila Residents.** *Phillipine Journal of Internal Medicine* 7(2):8-17, June 1969.

Data were gathered on some physical characteristics and cholesterol levels of 32 cases of acute myocardial infarction admitted to four large general hospitals in Manila in a one year period. There was a notable absence of fatty diets, sedentary occupations, obesity and hypercholesterolemia among these patients. A significant correlation was found between smoking and hypertension and the development of myocardial infarction in the patients.

71-0124. Hammond, E. C., Garfinkel, L., Seidman, H. **Longevity of Parents and Grandparents in Relation to Coronary Heart Disease and Associated Variables.** *Circulation* 43(1):31-44, January 1971.

Data were analyzed from a prospective epidemiological study in which a large number of men and women were traced for six years after they answered a detailed questionnaire. The subjects were divided into seven groups according to the longevity of their parents and grandparents. Death rates from coronary heart disease, hypertensive heart disease, and stroke were found to be considerably higher among subjects with short-lived parents than among subjects with long-lived parents. This was found to be the case for coronary heart disease among men without a history of high blood pressure or diabetes, who were not seriously overweight, who took some exercise, and who never smoked cigarettes regularly. (Auth. Abs. Mod.)

71-0125. Hay, D. R., Turbott, S. **Changes in Smoking Habits in Men Under 65 Years After Myocardial Infarction and Coronary Insufficiency.** *British Heart Journal* 32(6):738-740, November 1970.

Of 370 men under 65 years with acute myocardial infarction, 74 percent were smokers at the time of hospital admission. When interviewed up to 2 years later, the proportion of smokers among the 296 survivors had fallen to 44 percent. The number smoking more than 20 cigarettes a day fell from 137 (37 percent) to 18 (6 percent), and 38 of the former group gave up completely. At least half the survivors were able to make some reduction in their smoking. In a smaller group of 59 patients with acute coronary insufficiency, the percentage of smokers dropped from 75 percent to 60 percent. (Auth. Abs.)

71-0126. Leclercq, A., Proteau, J. **Intoxication Par l'Oxyde de Carbone. [Poisoning By Carbon Monoxide.]** *Concours Medical* 92(48):8955-8966, November 28, 1970, French.

Carbon monoxide poisoning is discussed in terms of physiopathology, clinical picture, development, complications, diagnosis, prognosis, etiology, toxicology, treatment, and medico-legal aspects. The degree of carbon monoxide poisoning is proportional to the carboxyhemoglobin in the blood, and 10 to 30 percent gives rise to dyspnea, headaches, and dizziness. One form of clinical diagnosis concerns the presence of blood carbon monoxide determined at the high level of 10 to 20 milliliters per thousand or higher, after suppression of tobacco smoke for 24 hours. Normally, the carboxyhemoglobin is equal to or less than 8 milliliters per thousand. In heavy smokers (more than 30 cigarettes a day), this level may go above 10 milliliters per thousand. In addition to blood studies, the presence of carbon monoxide can be determined spectroscopically.

71-0127. Liljefors, I. **Rokning och Koronarsjukdom (7): Rokvanor och Koronarsjukdom i ett Tvillingmaterial. [Smoking and Coronary Disease (7): Smoking Habits and Coronary Disease in Sets of Twins.]** *Lakartidningen* 67(2):161-164, January 7, 1970, Swedish.

In 1959 a study was made of coronary disease in twins born in Sweden between 1886 and 1925. Their surroundings, their habits, such as use of tobacco, and various clinical factors, including diabetes, blood pressure and serum lipids, were taken into consideration. Smoking was found to exert a definite effect on the constitution of the twins. Changes in constitution were those which predisposed them to coronary disease, so that smoking was an indirect cause of heart disease.

71-0128. Linn, B. S., Gaffney, C., Yurt, R. W., Richardson, J. R. (Jr.). **Determinants of Survival of the Dialysis Cannula.** *Southern Medical Journal* 63(10):1163-1166, October 1970.

A computer analysis was conducted to determine the most statistically significant factors concerned with failure of shunts for renal hemodialysis. Infection, days to dialysis, albumin, arterial cannula, average BUN, same size cannula and total serum protein were the most important factors. Smoking was not a significant factor.

71-0129. Luquette, A. J., Landiss, C. W., Merki, D. J. **Some Immediate Effects of a Smoking Environment on Children of Elementary School Age.** *Journal of School Health* 40(10):533-536, December 1970.

This study was conducted to determine the effects of a cigarette smoking environment on the heart rate, systolic and diastolic blood pressure of 51 elementary school age children (28 males, 23 females, mean age 9.8 years), 20 of whom came from nonsmoking homes and 23 from smoking homes. An effort was also made to determine if the children from nonsmoking homes reacted differently to the smoking environment than children from smoking homes and if males were affected differently than females. Results showed that cigarette smoke allowed to accumulate in a poorly ventilated enclosure significantly increased the children's heart rate, systolic and diastolic blood pressure, that the smoking environment's effect on the children in the environment was similar to the cigarette smoke's effect on the smoker but on a reduced scale, and that male and female subjects and children from smoking and nonsmoking homes reacted similarly to a 30 minute exposure to a smoking and nonsmoking environment.

71-0130. Mathiesen, F. R., Larsen, E. E., Wulff, M. **Some Factors Influencing the Spontaneous Course of Arterial Vascular Insufficiency.** *Acta Chirurgica Scandinavica* 136(4):303-308, 1970.

The spontaneous course in 474 extremities has been followed for a half to 6 years. The material demonstrates a higher mortality than a comparable group of normal population. In 211 cases the clinical state could be evaluated and showed improvement in up to two-thirds of the patients during the relatively short follow-up period. Termination of smoking increased the number of patients displaying spontaneous improvement. Anti-coagulation treatment in a smaller part of the material was not able to increase improvement and circulation measurement could not be demonstrated to have any prognostic value, but the impressive high percent of spontaneous improvement makes it necessary to arrange control series when therapeutic measures are to be evaluated. (Auth. Abs.)

71-0131. Newton, R. M., Seale, D. L., O'Brien, W. M., McGuire, L. B. **Clinical Correlations With Coronary Arteriography.** *Virginia Medical Monthly* 97(11):688-692, November 1970.

The description of chest pain, the electrocardiographic findings and the associated risk factors of age, smoking and serum cholesterol were related to the anatomical findings at coronary arteriography in 89 subjects. The differences in arteriograms for cigarette consumption were significant both in terms of nonsmokers and in terms of average number of cigarettes per day. The diagnostic value of a classically anginal pattern of pain and the significance of the risk factors were demonstrated. When chest pain was not exclusively and typically anginal, many patients did not have coronary stenoses. Inadequate cardiac acceleration despite the completion of a prescribed standard exercise stress appeared to be a cause of frequent falsely negative results in post-exercise electrocardiograms, although further exercise to nearly maximal levels did not always elicit electrocardiographic abnormalities in patients with stenoses.

71-0132. Oski, F. A., Gottlieb, A. J., Miller, W. W., Delivoria-Papadopoulos, M. **The Effects of Deoxygenation of Adult and Fetal Hemoglobin on the Synthesis of Red Cell 2,3-Dephosphoglycerate and Its *In Vivo* Consequences.** *Journal of Clinical Investigation* 49(2):400-407, February 1970.

Patients over 1 month of age with arterial oxygen pressures of less than 60 mm Hg were found to have elevated red cell 2,3-diphosphoglycerate (2,3-DPG) levels and blood with a decreased affinity for oxygen. The increase in 2,3-DPG was proportional to the degree of hypoxemia. In patients under 1 month of age this relationship was not observed. Red cells from adults, but not newborns, showed rapid increases in 2,3-DPG when incubated under nitrogen. Adult, but not fetal, deoxyhemoglobin was shown to facilitate *in vitro* synthesis of 2,3-DPG by binding this organic phosphate and relieving the product inhibition of 2,3-DPG mutase. Throughout a wide range change in oxygen affinity as measured by the P_{50} is linear with respect ot the 2,3-DPG concentration; a change of 430 millimicromoles of 2,3-DPG/ml of red blood corpuscles (RBC) resulting in a change of the P_{50} of 1 mm Hg. It appears that the 2,3-DPG of the adult's red cells responds rapidly to metabolic and environmental influences and in turn effects metabolism and the cellular environment. Many of these effects are not shared by the red cells of the newborn.

71-0133. Platt, Lord, Ball, K. P., Brigden, W. W., Doll, R., Oliver, M. F., Reid, D. D., Shillingford, J. P., Thomson, A. M., Begg, T. B. **Dietary Sugar Intake in Men With Myocardial Infarction. Report to the Medical Research Council by Its Working-Party on the Relationship Between Dietary Sugar Intake and Arterial Disease.** *Lancet* 2(7686):1265-1271, December 19, 1970.

The sugar consumption of men with myocardial infarction was compared with that of matched controls in four different centers. The average sugar consumption was slightly greater in the patients with myocardial infarction than among the controls, but the differences were not statistically significant. Findings in one center suggest that the slightly higher sugar intake in patients with myocardial infarction was likely to have been due to an association between the consumption of sugar and the smoking of cigarettes. (Auth. Abs.)

71-0134. Rose, G. **A Proposed Trial of Heart Disease Prevention in Industry.** *Transactions of the Society of Occupational Medicine* 20(3):109-111, July 1970.

A trial plan for coronary heart disease prevention in British industry involving 20,000 middle-aged men (ages 40 to 59) distributed among 20 factories (10 treatment and 10 control) and with a 5 to 7 year follow-up period is outlined. Screening examinations would determine high risk individuals. Preventive measures would then be applied, including cessation of smoking, reduction of blood cholesterol, regular moderate physical activity, treatment of even mild hypertension and control of obesity. Health propaganda and prevention advice at the group or factory level would also be made available. The follow-up would measure the effect of advice and treatment on coronary heart disease mortality and the incidence of other major manifestations of disease.

71-0135. Scheidt, S., Ascheim, R., Killip, T. (III). **Shock After Acute Myocardial Infarction. A Clinical and Hemodynamic Profile.** *American Journal of Cardiology* 26(6):556-564, December 1970.

Clinical features, predisposing factors, precipitating events, laboratory and hemodynamic observations, pathologic findings, prognostic indicators and the results of therapy are surveyed for 73 patients in whom shock developed after acute myocardial infarction. The incidence of previous myocardial infarction, angina pectoris and hypertension was similar in patients with and without shock. Other factors, such as prior digitalis therapy, heart failure and smoking, were not clearly implicated. No precipitating cause for shock other than acute infarction itself was consistently present. Hypovolemia, anemia, arrhythmia and drugs could not be incriminated as important factors in the genesis of shock. Extensive myocardial damage, coronary atherosclerosis and left ventricular hypertrophy were found at postmortem examination in most patients who died, but similar findings were noted in patients who died without evidence of shock. Delay in onset of shock in many cases suggested progression of cardiac damage after the initial clinical event. Hemodynamic studies in 19 patients showed that cardiac index was less than half of the normal index, stroke volume index about a third of normal, and peripheral resistance generally increased. (Auth. Abs. Mod.)

71-0136. Sepaha, G. C., Jain, S. R., Chhabra, M. L., Dixit, V. P. **Chronic Cor-Pulmonale. (A Study of 1,000 Cases.)** *Indian Heart Journal* 21(4):383-388, October 1969.

Some of the epidemiological aspects of chronic cor pulmonale cases are analyzed at the Shri G. S. Cardiology Department, M. Y. Hospital, Indore, India. The disease forms 15 percent of organic heart disease at the hospital and among inpatients it forms 24.4 percent of cardi ac admissions and is responsible for 26.7 percent of total cardiac deaths. The peak incidence of the disease is during January and February. The disease occurs in a 3 to 1 ratio of males to females, with smokers accounting for 70 percent of the males and 10 percent of the females. Chronic bronchitis is present in 76 percent of the cases, ischemic heart disease in 7.9 percent and ECG evidence of right auricular, ventricular hypertrophy and/or strain in 78 percent.

71-0137. Stamler, J., Lilienfeld, A. M. (Chairmen). **Primary Prevention of the Atherosclerotic Diseases.** *Circulation* 42(6):A55-A95, December 1970.

Epidemiological, clinical and experimental evidence, both animal and human, is reviewed which supports the judgment that there is a causal relationship between risk factors, particularly cigarette smoking, hypercholesteremia and hypertension, and the development of coronary heart disease. Research findings on the risk factors strongly indicate the possibility of effective primary prevention of atherosclerotic diseases, particularly premature coronary heart disease. Recommendations are made for a national commitment to primary prevention as the principal means of controlling coronary heart disease and other atherosclerotic diseases, and include changes in diet to prevent or control hyperlipidemia, obesity, hypertension and diabetes, elimination of cigarette smoking, and pharmacologic control of elevated blood pressure.

71-0138. Stephens, W. B. **Post-Myocardial Infarction Pain in a Series of Male Patients in the Albury-Wodonga District.** *Medical Journal of Australia* 2(11)):492-494, September 12, 1970.

One hundred and ten males of an average age 54.7 years have been interviewed more than six months after myocardial infarction. None of these patients had been treated in a coronary care unit, and only four were receiving long-term anticoagulant therapy. All patients were living in the country. The nature and frequency of post-myocardial infarction pain in these patients have been classified, and attitudes towards physical exercise, the use of glyceryl trinitrate and smoking habits have been examined. The study has been compared with an earlier study performed on patients attending the Royal Melbourne Hospital. The results are similar, suggesting that the initial management of the patient does not influence subsequent pain patterns. (Auth. Abs.)

71-0139. Thiseus, S., Tibbling, L. **Rokning och Koronarsjukdom (9): Angina Pectoris Eller Angina Cardiae? [Smoking and Coronary Disease (9): Angina Pectoris or Angina Cardiae?]** *Lakartidningen* 67(2):165-167, January 7, 1970, Swedish.

The investigation dealt with women, who presented a rather unusual picture of angina pectoris when they were smokers. Both pregnancy and overweight predisposed them to hiatus hernia. In all, 600 patients were systematically investigated for pressure inside the esophagus and the pH there. It was found that a disease diagnosed as angina pectoris often was really a disease of the esophagus, and a cardiac insufficiency attributed to smoking was actually an esophagus irritation due to smoking.

71-0140. Tibblin, G., Wilhelmsen, L. **Rokning och Koronarsjukdom (5): 1913 Ars Man. [Smoking and Coronary Disease (5): People Born in 1913.]** *Lakartidningen* 67(2):153-155, January 7, 1970, Swedish.

In 1963, 973 people from Goteborg born in 1913 were selected for a heart disease study. In 1967, a follow-up study was made of 803 available subjects. In addition to morbidity and mortality, a number of parameters were observed, including smoking habits. The results clearly indicate that smoking is an important risk factor in coronary disease. In a sample of 22 persons who developed myocardial infarct between 1963 and 1969, only one was a nonsmoker.

71-0141. Wenzel, D. G., Azmeh, N. **Chronically Administered Nicotine and the Blood Pressure of Normotensive and Renal Hypertensive Rats.** *Archives Internationales de Pharmacodynamie et de Therapie* 187(2):367-376, October 1970.

The chronic administration of low doses of nicotine (1.14 or 2.28 mg/kg/day) in the drinking water of rats elevated the mean systolic pressure. As previously demonstrated, when this treatment was prolonged the pressor effect was reversed and a depressor effect was ultimately obtained. With larger doses (3.42 or 4.56 mg/kg/day) only a depressor effect was observed. Withdrawal of nicotine during the depressor phase produced a marked, fluctuating, and prolonged pressor response. Administration of either the "low" or the "high" doses of nicotine lowered the systolic pressure of renal hypertensive rats to below control levels. This effect was not observed until the neurogenically-maintained phase of renal hypertension was established. The results are discussed in terms of the potential effects of smoking in normotensive and hypertensive individuals. (Auth. Abs.)

See also **71-0006, 71-0016, 71-0021, 71-0023, 71-0024, 71-0038, 71-0043, 71-0044, 71-0065, 71-0087, 71-0091, 71-0094**

OTHER DISEASES AND CONDITIONS

71-0142. Brown, A. M., Young, A. **The Effects of Age and Smoking on the Maturation of the Oral Mucosa.** *Acta Cytologica* 14(9):566-569, November-December 1970.

Palatal, buccal and lingual cytological specimens were taken from 106 subjects to determine possible differences in the normal mucosal maturation patterns of males and females and the effects of age and smoking on these patterns. Effects were measured by means of the Karyopyknotic Index, which was computed as the ratio of anucleate squames and superficial (pyknotic) cells to all cells of a specimen. The results demonstrated different Karyopyknotic Indices for different areas of the oral mucosa and these indices varied with the age and smoking habits but not the gender of the subject. The buccal and lingual mucosa showed an increased Karyopyknotic Index with age, in distinct contrast to the palatal mucosa. Smoking increased the Karyopyknotic Index of all three mucosal areas in all age groups and thus appears to have the most profound and consistent effect on oral mucosal maturation.

71-0143. Chin, C. T., Lee, K. W. **The Effects of Betel-Nut Chewing on the Buccal Mucosa of 296 Indians and Malays in West Malaysia. A Clinical Study.** *British Journal of Cancer* 24(3):427-432, September 1970.

Changes in the buccal mucosa of 296 Indian and Malay betel-nut chewers in Perak, West Malaysia, were studied clinically. One-hundred and sixty-seven out of 212 Indian subjects incorporated tobacco in their quids, while 45 out of 84 Malay subjects incorporated "Gambir". The Indians appeared to show a higher proportion of mucosal changes, particularly when tobacco was used. "Gambir" did not appear to be potent in the production of mucosal changes. Comparison with studies in other parts of the world suggested comparable findings with respect to both tobacco and non-tobacco chewing samples, and there would appear to be some evidence that tobacco-containing quids are likely to produce a higher proportion of mucosal changes as compared to non-tobacco-containing quids. An attempt to demonstrate a dose-effect relationship by dividing the subjects into "slight" and "heavy" chewers did not yield significant differences between these two categories in each of the groups. (Auth. Abs.)

71-0144. Drac, P., Kopecny, J. **Sterilitat bei Raucherinnen und Nichtraucherinnen. [Sterility in Smoking and Nonsmoking Women.]** *Zentralblatt fur Gynakologie* 92(27):865-866, July 4, 1970, German.

For 10 years 221 smoking women (smoking 4-40 cigarettes a day) have been compared to 1200 nonsmoking women. The women came to a sterility clinic. Menstrual disorders were found in 36 percent of the smokers as compared with 35 percent of the nonsmokers. For those smoking over 10 cigarettes a day the number was about 50 percent higher. The premenstrual endometrium biopsy showed a pathological condition in 84 percent of the smokers as compared with 81 percent of the nonsmokers. Trichomoniasis was found in 28 percent of the smokers against 17 percent of the nonsmokers. Post-inflammatory changes of the adnexa appeared in 64 percent of the smokers, against 38 percent of the nonsmokers, pathological conditions in salpingography appeared in 81 percent of smokers compared to 60 percent nonsmokers. The effect of smoking on gynecological inflammations appears to be indirect, and has more of a sociological aspect.

71-0145. Dummett, C. O. **Systemic Significance of Oral Pigmentation.** *Postgraduate Medicine* 49(1):78-82, January 1971.

Embedded dental amalgam and tobacco stains are examples of local causes of color changes of the oral mucosa. Color changes may also result from endogenous conditions which include heavy metal intoxication such as bismuthosis, plumbism, argyria, mercurialism and arseniasis. Systemic diseases and disorders known to produce oral discolorations include Addison's disease, deficiency of vitamin B_2, jaundice, Peutz-Jeghers syndrome, cyanosis and polycythemia. (Auth. Abs.)

71-0146. Harris, J. O., Swenson, E. W., Johnson, J. E., (III). **Human Alveolar Macrophages: Comparison of Phagocytic Ability, Glucose Utilization, and Ultrastructure in Smokers and Nonsmokers.** *Journal of Clinical Investigations,* 49(11):2086-2096, November 1970.

Phagocytic ability, glucose utilization, and ultrastructural morphology were studied in human alveolar macrophages in smokers and nonsmokers. The macrophages were obtained by bronchopulmonary lavage and the studies were carried out *in vitro* in the absence of smoke. Phagocytic ability was measured as the decrease in the number of viable *Staphylococcus albus* organisms incubated with the macrophages. Measurements of $^{14}CO_2$ formation from glucose-U-^{14}C were made in a resting state. Of the cells obtained by lavage, 90-95 percent were large mononuclear macrophages of which approximately 90 percent remained viable at the end of the experiment. Smokers yielded many more macrophages per lavage (mean 46.4×10^{6}, ±7.4) compared to the nonsmokers (mean 10.2×10^{6} ±2.3). The decline in viable organisms was the same in each group, indicating phagocytic competence of alveolar macrophages removed from smokers. However, the mean glucose utilization for the smokers was 4.3 ±0.2 micromoles/10^{6} cells and 1.4 ±0.7 micromoles/10^{6} cells for the nonsmokers. This very significant difference ($P < 0.0001$) suggests that smokers' macrophages have a higher resting energy requirement than those of nonsmokers. Comparison of the ultrastructural morphology of the alveolar macrophages from each group reveals that the cells from smokers differ from those of nonsmokers in that they are slightly larger, and contain more golgi vesicles, endoplasmic reticulum, and residual bodies. The residual bodies in smokers' cells contain distinctive fiber-like inclusions. (Auth. Abs.)

71-0147. Johansson, C. R., Ronge, H. **Acute Irritation Effects of Tobacco Smoke in Room Air.** Translated from *Nordisk Hygienisk Tidskrift* 46:49-50, 1965.

Complete English Translation of **F-01848.**

71-0148. Lebbe, J., Lafarge, J.-P., Laplace, M. **Recherche et Dosage de la Nicotine Dans les Urines par Chromatographie en Phase Gazeuse. [Research and Measurement of Nicotine in the Urine by Gas Chromatography.]** *Archives des Maladies Professionnelles de Medecine du Travail et de Securite Sociale* 28(6):558-560, June 1967, French.

Gas chromatographic studies, using a flame ionization detector, showed that there is a substance present in the urine of smokers which retains nicotine. Elimination and metabolism of nicotine in these subjects may be checked by physical or physical chemical methods. A male subject who smoked 30 cigarettes a day showed 1.39 mg of nicotine over a 24-hour period of urine collection. A male who smoked 30 g of pipe tobacco eliminated 1.28 mg of nicotine over a 24-hour urine-collection period. Nicotine can be detected from a volume of urine on the order of 10 ml.

71-0149. Lee, K. W., Chin, C. T. **The Effects of Betel-Nut Chewing on the Buccal Mucosa: A Histological Study.** *British Journal of Cancer* 24(3):433-441, September 1970.

Sixty-two "leukoplakias" from the checks of betel-nut chewers in West Malaysia were studied histologically. Ten biopsies were from non-tobacco betel-nut chewers. An amorphous von Kossa positive layer was seen on the keratin surface in 42 specimens. Tobacco did not appear essential for its formation, and it appeared to be significantly associated with parakeratosis. Its possible significance as a cuticle-like layer prolonging contact between carcinogens and the mucosa is discussed. Parakeratosis appeared to be the most common form of cornification seen, and the mitotic activity in parakeratinized leukoplakias appeared to be significantly greater than orthokeratinized leukoplakias. Comparison with studies on other population samples using different quids suggested that severe histological changes were more likely to be seen when tobacco-containing quids were chewed as compared to non-tobacco-containing quids. An attempt to correlate the histological changes seens with the clinical habit in leukoplakias from chewers using tobacco-containing quids suggested that epithelial atrophy appeared to be significantly related to the duration of the habit but not to the "intensity" of the habit. (Auth. Abs.)

71-0150. Lefcoe, N. M., Inculet, I. I. **Particulates in Domestic Premises. I. Ambient Levels and Central Air Filtration.** *Archives of Environmental Health* 22(2):230-238, February 1971.

Air particulates were surveyed in a home with central ventilation and an electrostatic filter in the main air duct with the returning air sampled. The average counts, in the 0.3, 0.5, and 1.0 micron ranges, were related to the normal activities, children playing, house cleaning, and smoking, with the following observations: Counts in all ranges under minimal activity were significantly different when the filter was on compared to when the filter was off. Cleaning and dusting in the home overwhelmed the filter. Smoking one cigar in the home raised particle counts from 10 to 100 times. These particle counts stayed up for at least three hours when the filter was off. The counts returned towards base line levels in one to two hours with the filter on. (Auth. Abs.)

71-0151. McGlothlin, W., Jamison, K., Rosenblatt, S. **Marijuana and the Use of Other Drugs.** *Nature* 228(5277):1227-1229, December 19, 1970.

In October 1969, during Operation Intercept (a government effort to diminish the supply of marijuana), 478 graduate and undergraduate students and 116 patients from a free clinic specializing in treatment of drug users were surveyed to determine the incidence and frequency of use of various drugs, whether those using marijuana had reduced their use during Operation Intercept, and whether the frequency of use of other drugs had increased as a result of the marijuana shortage. Marijuana prices during the spring, summer and autumn of 1969 were also compared. Fewer students than free clinic patients used tobacco and alcohol. The use of other drugs was strongly correlated with the frequency of marijuana use in the students and to a lesser extent in the patients. In the patients, frequent marijuana users reported less use of alcohol. The preference for hashish over marijuana was more common among patients than students. Of those using marijuana 10 times or more, 44 percent of the students and 51 percent of the patients reported below normal use of marijuana between May and October 1969 as a result of its unavailability. Students substituted hashish, alcohol and strong hallucinogens. Patients has a similar preference but also substituted sedatives, stimulants and opiates. The mean price of marijuana per ounce rose from $10.13 during the spring of 1969 to $11.87 in October 1969.

71-0152. Miles, S. **The Respiratory System and Sport.** *Journal of the Royal College of General Practitioners* 18(86):181-185, September 1969.

The smoking habits of 337 men who were given the Harvard Pack Test for Physical Efficiency were studied. Of the total, the 256 smokers have a mean fitness index of 60 whereas that of the nonsmokers is 73. The index does not vary greatly with the number of cigarettes smoked. There are too few pipe smokers in the series to draw any firm conclusions. There is little doubt that smoking has an adverse effect on performance. However there will be those who claim that the loss is worth accepting for the comfort given by smoking and there are even top class athletes who find that a quiet cigarette before the ordeal has a steadying effect on the nerves.

71-0153. Myslinska, M. **Wplyw Palenia Tytoniu na Poziom Rodankow w Slinie Mieszanej Oraz Izolowanej z Gruczolu Przyusznego. [Influence of Tobacco Smoking on Thiocyanate Level in Saliva Mixed or Isolated From the Parotid Gland.]** *Roczniki Pomorskiej Akademii Medycznej Imienia Generala Karola Swierczewskiego w Szczecinie* 16:255-289, 1970, Polish.

Studies were performed on the concentration of thiocyanates in mixed saliva of 234 persons, 137 tobacco smokers and 97 nonsmokers, aged from 7 to 60 years. At the same time the CNS⁻ contents in saliva both mixed and isolated from the parotid glands of persons aged 7 to 60 years were compared. A mumber of experiments dealing with tobacco smoke and the saliva were carried out *in vitro*. As concerns the mixed saliva alone, the studies were accomplished in 2 groups of normal people: a) those exposed to chemical noxiousness of the work medium, b) those employed in the atmosphere free of that noxiousness. The results obtained revealed that the lowest level of thiocyanate in the mixed saliva was found in soldiers of the general military conscription (both smokers and nonsmokers), the highest was in the studying youth. The chemical noxiousness, recorded in the industrial plants being investigated, failed to display any perceptible effect on the CNS⁻ concentration in the mixed saliva. The investigations of the first series of experiments as well as the comparisons of values referring to saliva mixed and isolated from the parotid gland itself indicated that the tobacco smoking exerted an essential influence on the CNS⁻ level in saliva, since the number of smoked cigarettes was accompained by an increase of the CNS⁻ concentration in saliva both isolated and mixed. In mixed saliva of the smokers, the thiocyanate concentration increased proportionally to the intensity of smoking, while in the isolated saliva, the increase in the same order was not proportional. On the basis of the preliminary studies covering the composition of the tobacco smoke, it may be assumed that a high level of rhodanates in mixed saliva of tobacco smokers is likely to be derived from the saliva supersaturated in the oral cavity at the time of inhaling the cigarette smoke. In nonsmokers, the thiocyanate level in the isolated saliva from the parotid gland exceeded almost twice the CNS⁻ concentration in the mixed saliva, which may result from inhaling the air containing a high amount of tobacco smoke without personally smoking the cigarettes. (Auth. Abs. Mod.)

See also **71-0027, 71-0040, 71-0128, 71-0158, 71-0167**

71-0154. Schirren, C. **Die kinderlose Ehe. Moglichkeiten und Grenzen der Behandlung aus andrologischer Sicht. [The Childless Marriage. Possibilities and Limitations of the Treatment From the Andrological Viewpoint.]** *Fortschritte der Medizin* 88(27):1047-1051, September 24, 1970, German.

Hormone therapy may be of value in correcting disturbances in male fertility if this is the cause of family childlessness. The treatment is contraindicated however in cases of varicocele, heavy consumption of tobacco, and the intake of various therapeutic agents. Nicotine has a pronounced influence on human reproductive organs. A statistical evaluation of the fertility of smokers and nonsmokers reveals nothing of significance but observation of individual patients shows that heavy consumption of cigarettes results in serious disturbances in sperm motility. This sensitivity toward nicotine is individual since certain males can smoke 80 cigarettes per day without evidence of this syndrome. In nicotine-sensitive males, a withdrawal of nicotine results in an increase in sperm count and sperm motility.

71-0155. Vavercak, F. **Smoking and Pregnancy.** Translated From *Ceskoslovenska Gynekologie* 33(3):197-200, 1968.

Complete English Translation of **A-09388.**

71-0156. Vertes, L. **Schadliche Wirkungen vom Rauchen auf die Gestation. [Noxious Effects of Smoking on Gestation.]** *Zentralblatt fur Gynakologie* 92(42):1395-1398, October 17, 1970, German.

Research is reported of 243 cases of spontaneous absortion in pregnant women 96 percent of whom smoked. Births came earlier in proportion to the higher number of cigarettes smoked. Nicotine involves depolarization and affects the ganglions, sympathetic and parasympathetic nervous system. It activates the hypothalamus-neurohypophysis system. A tocogram shows data on women giving birth to their first child, time between contractions, and amplitude from 5 to 7 millimeters, factors being influenced by nicotine presence. Smoking is known as an etiological factor of fetus motion up to the event of birth. Many authors agree that nonsmoking women become passive smokers and thus suffer the deleterious effects of the habit. Smoking during pregnancy is not only dangerous, but unfair to the unborn child.

BEHAVIORAL AND EDUCATIONAL RESEARCH

71-0157. Becker, W. **Schulkind und Tabak. [Students and Tobacco.]** *Therapie der Gegenwart* 109(8):1198-1207, August 1970, German.

Since it has been determined that in Germany during 1968, an increasing high rate of deaths from bronchial and respiratory diseases was registered, a campaign against smoking was started by the physicians, especially directed toward students who had not yet acquired the tobacco habit. In addition to alcohol, tobacco should also be prohibited in working places. Legal backing was obtained, as well as aid from educators and counselors, but the example of parents who give up smoking was considered a greater motivation to youth. Nonetheless, more tobacco products are being sold than formerly in Germany and this suggests that more youths are acquiring the habit. Twenty-five percent of 14 to 16 year olds smoke regularly, probably influenced by mass acceptance of their peers, status symbols, and social prestige. Because youth are emancipated at earlier ages today, the use of hashish has become more prevalent, since tobacco products can generally be purchased throughout the world by youths under 15 years of age. Mass media must attack the problem more actively, and cigarette vending machines should be restricted.

71-0158. Cendron, H., Vallery-Masson, J. **The Effects of Age on Masculine Sexual Activity. Incidence of Several Factors Including Tobacco.** Translated from *Presse Medicale* 78(41):1795-1797, October 3, 1970.

Complete English Translation of **70-1127.**

71-0159. Davison, R. L. **An Analysis of an Anti-Smoking Research Study in a College of Further Education.** *Journal of the Institute of Health Education* 3:77-81, 1970.

This study compared differences in the effectiveness of two educational methods in their influence on the smoking behavior of 173 students (11 men and 162 women), ages 17½ to 21 years, at a small college. Each of two groups was given a short talk in reinforcement of the visual aid and questions were invited; whereas the "discussion" group was asked for comment immediately after the film and was encouraged to participate in free discussion. All students filled out questionnaires concerning their smoking habits and again 6 months later. Results showed that a greater percentage of the students on the "discussion" group had quit smoking; however, the difference between the two groups was only slightly significant. In looking at students who started smoking in each group, the "discussion/decision" method showed a greater apparent effect in preventing nonsmokers from taking up the habit. This difference was statistically significant. Two admitted deficiencies in planning were lack of information about parental smoking habits and the absence of a control population.

71-0160. Egsmore, T. **Comunicacion Social y Salud Publica. [Social Communication and Public Health.]** *Salud Publica de Mexico* 12(4):437-440, July-August 1970, Spanish.

The use of mass media to educate and inform society of various problems in public health, particularly cigarette smoking and automobile accidents, is discussed.

71-0161. Frost, D. M. **The Physician's Role in the S. Dak. Drug Scene.** *South Dakota Journal of Medicine* 23(9):47-51, September 1970.

A survey was made of drug abuse (marihuana, LSD, methedrene, pep pills, alcohol and cigarettes) among 7000 students ages 12 to 22 in the school system of Sioux Falls, South Dakota. The figures are not considered to be alarming, but do indicate that the problem of drug abuse is likely to become worse in the near future. Several suggestions are offered for making physicians aware of the drug abuse problem.

71-0162. Horn, D. **Factors Affecting the Cessation of Cigarette Smoking: A Prospective Study.** Presented at the Eastern Psychological Association Meeting, Washington, D.C., April 18, 1968, 11 pp.

In 1964, a sample of U.S. adults was interviewed on knowledge, attitudes, beliefs and practices with regard to smoking. Twenty months later 1,570 persons identified as cigarette smokers or ex-smokers were reinterviewed to determine the predictive value of attitudes, beliefs, smoking practices and various types of background information for subsequent success in stopping smoking. Of the 1,570 persons, 52.9 percent considered giving up smoking, 34.4 percent tried to quit, 15.5 percent achieved short-term success, and 7.1 percent achieved long-term success. Those who considered quitting accepted the requirement of a cigarette warning label, were less likely to expect to be smoking 5 years from now, had a lower dosage score, were more likely to smoke filter or low tar cigarettes, were more likely to know someone who would make it hard for them to quit and were more likely to have been advised to stop or cut down. Those trying to quit were less likely to agree on having additional restrictions on places prohibiting smoking, were less likely to expect to be smoking 5 years from now, smoked fewer cigarettes and had a lower dosage score. Those with short-term successes smoked fewer cigarettes, had a lower dosage score and were more likely to use filter cigarettes. Those with long-term successes were more likely to expect not to be smoking 5 years from now and were less likely to have been advised to stop or cut down. The perception of the threat of smoking was broken down into: (1) importance of the threat, (2) personal relevance of the threat, (3) capability for cessation, and (4) value of cessation. The influence of these four factors and their interaction on the four steps in giving up smoking were analyzed. All the factors except Capability for Cessation contributed to considering quitting. This factor also interacted with Importance to reduce its effect. Both Importance and Capability for Cessation contributed to attempting to quit. Capability for Cessation was most important in predicting short-term success. Value of Cessation also contributed to short-term success. Personal Relevance contributed positively and significantly to thinking about quitting, negatively but not significantly to trying to quit and to short-term success, and significantly and negatively to long-term success.

71-0163. Huttner, I., Huttner, H. **Die Motivation des Gesundheitsverhaltens. Teil 3. [Motivation to Stay Healthy. Part 3.]** *Zeitschrift fur Arztliche Fortbildung* 64(11):561-565, June 1, 1970, German.

People are motivated to stay healthy by their parents, their age, their general state of health, the advice of a physician, and material and career setbacks due to disease.

The smoking habit is most strongly affected by parents. One out of every four nonsmokers was deterred from smoking because his parents impressed upon him the health hazards of smoking. However, parental influence varies and depends on their educational level and age.

71-0164. Kahn, E. B., Edwards, C. N. **Smoking and Youth: Contributions to the Study of Smoking Behavior in High School Students.** *Journal of School Health* 49(10):561-562, December 1970.

The cigarette smoking behavior of 1348 junior and senior high school students and their respective parents was studied. Results showed that males started smoking because their parents smoked or because their peers smoked, and particularly, if their siblings smoked. They were most effectively deterred from smoking by a concern for their health. Females were found to be more open to experimentation, less influenced by parental behavior and most frequently deterred by social desirability. Females were also influenced by siblings who smoked.

71-0165. Kanekar, S., Dolke, A. M. **Smoking, Extraversion, and Neuroticism.** *Psychological Reports* 26(2):384, April 1970.

The Eysenck Personality Inventory was administered to 100 male Indians ages 25 to 35 years who were divided into nonsmokers, light smokers (1 to 10 cigarettes/day) moderate smokers (11 to 20 cigarettes/day) and heavy smokers (over 20 cigarettes/day). Results showed a positive relationship between amount of smoking and degree of extraversion, and a negative relationship between amount of smoking and degree of neuroticism. The findings are consistent with Eysenck's theory regarding the association between smoking and extraversion but suggest a complex relationship between smoking and neuroticism which is inconsistent with the theory.

71-0166. Kanfer, F. H. **Self-Monitoring: Methodological Limitations and Clinical Applications.** *Journal of Consulting and Clinical Psychology* 35(2):148-152, October 1970.

This paper discusses some methodological, clinical and theoretical issues concerning McFall's study of the effect of self-monitoring on smoking behavior. The difficulties in ascertaining reliability of self-reports for events which have no external referents and the reactivity of self-monitoring limit the utility of self-observation as a control procedure in evaluating behavior therapy techniques. In clinical application, self-monitoring has been noted to modify behavior, but its controlling variables have not yet been explored. Self-observation is an initial step in self-directed behavior change. Therefore, its consideration is also required for conceptualization of self-regulatory processes, viewed as integration of response feedback utilization, self-control, and self-reinforcement, to attain self or externally prescribed performance standards. (Auth. Abs. Mod.)

71-0167. Mushin, W. W. **The Normality of the Abnormal. Eighth Annual Baxter-Travenol Lecture.** *Anesthesia and Analgesia, Current Researches* 49(5):667-679, September-October 1970.

The concept of "normality" in the range of those physiologic functions with which anesthesiology is concerned is examined in terms of possible iatrogenic sequelae, the effects of smoking, obesity, circadian rhythms and aging, and halothane induced jaundice.

71-0168. National Center for Health Statistics. **Changes in Cigarette Consumption Between June 1966 and August 1968.** U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration, Rockville, Maryland, Monthly Vital Statistics Report, Health Interview Survey Data, 19(9, Supplement):1-4, December 18, 1970.

Data on the daily consumption pattern of smokers between June 1966 and August 1968 show that the only consistent decline during this period was for persons smoking 10 or fewer cigarettes daily, a 3 percent decrease, and was largest in those 65 years and over. In the 11-20 cigarettes/day group, males 45-64 years of age showed a 5 percent increase and females 65 years and over showed a 15 percent increase. For those smoking 21-40 cigarettes daily, there was an increase of 24 percent for males and 43 percent for females 65 years and over. Persons aged 17-24 years smoking more than 2 packs per day showed a decrease for both sexes.

71-0169. Newman, I. M., Ang, J., Irwin, R. P., Smith, J. McC. **Adolescent Cigarette Smoking.** *New Zealand Medical Journal* 72(460):161-166, September 1970.

A questionnaire was administered to 2,024 male and female high school students from both North and South Island schools. Results of this survey indicated that between one-quarter and one-third of New Zealand high school students, depending on form in school, were admitted cigarette smokers. In addition, it is reported that, while more males than females were cigarette smokers, females tended to begin their smoking earlier than males. Students who smoked had been smoking for more than one year tended to select filter tipped cigarettes. Cigarette smokers had lower educational aspirations and dropped out of school earlier than non-smokers. A higher percentage of female smokers predicted they would still be smoking in five years time, and there was also evidence that a higher percentage of female smokers were involved in the competitive athletic program of their school. It is pointed out that, considering the medical evidence to link cigarette smoking to certain pathological conditions, there is a real need for educational programs to reduce tobacco consumption as a neccessary step in general preventive medicine. (Auth. Abs.)

71-0170. Orne, M. T. **From the Subject's Point of View, When is Behavior Private and When is it Public: Problems of Inference.** *Journal of Consulting and Clinical Psychology* 35(2):143-147, October 1970.

In an invited discussion, methodological questions concerning McFall's study of the effect of self-monitoring on smoking behavior are raised. It is emphasized that results of such studies should be evaluated from the point of view of the subject rather than the investigator. Some measures assumed to be unobtrusive by the investigator share qualities of deception experiments. It must be determined, therefore, whether it is the subject or the experimenter who is deceived. Procedures that may be helpful in clarifying such questions and the difficulties of generalizing results to other contexts are discussed. (Auth. Abs.)

71-0171. O'Rourke, A., O'Sullivan, N., Groke, M. **A Study of Children's Smoking Habits in Kerry.** *Irish Nurses Journal* 3(3):17-19, March 1970.

A smoking habit survey of 1516 boys and girls attending vocational schools in Kerry was conducted in 1969. Results showed that 22.7 percent of the boys and 9.6 percent of the girls were current smokers. Over half of the school population had tried smoking. Although Kerry pupils did not smoke quite as much as their Dublin counterparts, 38 percent of 16-year-old boys were confirmed smokers. (Auth. Abs. Mod.)

71-0172. Piper, G. W., Jones, J. A., Matthews, V. L. **The Saskatoon Smoking Project – The Model.** *Canadian Journal of Public Health* 61(6):503-508, November-December 1970.

The behavioral processes involved in a student-directed smoking education program are examined along with a model that deals with group behavior and with individuals as members of a group. The model defines five stages through which a person adopts a new form of behavior and describes the influences to which he is susceptible at each stage. Questions arising from the application of the model to smoking education and some of the consequences of such programs are discussed.

71-0173. Remschmidt, H., Dauner, I. **Klinische und soziale Aspekte der Drogenabhangigkeit bei Jugendlichen. Teil 1. [Clinical and Social Aspects of Drug Dependency in Young People. Part 1.]** *Medizinische Klinik* 65(45):1993-1997, November 6, 1970, German.

Various aspects of dangerous drugs, including lysergic acid diethylamine, mescaline, hashish, and morphine derivatives, are reviewed in terms of increasing dosage, as well as physical and psychological dependency. In Germany, as in most western European countries, most youths over 16 years of age smoke. Psychologists have elicited reasons given for smoking as: pleasure and enjoyment, custom and habit, and relaxation and unwinding. Only three percent of youths replying gave no reason for taking up the habit. Although statistics are not available on hashish addiction in Germany, it is stated that about 25 percent of young students have tried hashish and about 8 percent smoke marijuana on a fairly regular basis. The euphorious effect of higher dosages of these narcotic agents is noted. Frequent use results in hallucinations, and time and space distortions. The aphrodisiacal properties of hashish are disputed.

See also **71-0068, 71-0151**

71-0174. Tobacco. **U.S.S.R. Nothing Done by Authorities to Discourage Smoking Habit.** *Tobacco* 172(2):23-24, January 8, 1971.

The failure of Russian authorities to limit or discourage the use and sale of tobacco products is briefly discussed.

71-0175. Van Proosdij, C. **De Problematiek van de Gehechtheid aan Tabaksgebruik. [The Problem of the Attachment to Tobacco Use.]** *Nederlands Tijdschrift Voor Geneeskunde* 114(40):1662-1667, October 3, 1970, Dutch.

Tobacco is addictive when it becomes an important motive in the smoker's existence. It is difficult to induce people to stop smoking, and they will do so only when they develop a serious syndrome such as oral cancer, Buerger's disease or nicotine poisoning. Many countries have a flourishing tobacco and cigarette industry and cessation of smoking would have severe economic consequences. Switching from cigarettes to cigars and pipes would be a step in the right direction. The time is not ripe for complete abstinence, but there is hope of promoting smoking pauses during which people would cease smoking for a certain length of time, and later of extending these pauses.

71-0176. Weissmann, K. **Um Teste de Realidade. Luto e Tabagismo. [A Test of Reality. Mourning and Tobaccoism.]** *Revista Brasileira de Medicina* 25(3):190-191, March 1968, Portuguese.

The psychoanalytical relationship between mourning and tobacco smoking is discussed briefly, and it is stated that inveterate smokers have been known to give up smoking during mourning. This is attributed to the emotional impact resulting in a greater expression of maturity on the part of the mourners, due to the removal of unconscious resistance to forego smoking. This is the test of reality. In normal mourning there is an improvement in the general psychosomatic condition of the individual due to suppression of smoking. In abnormal mourning, many individuals who were formerly nonsmokers, take up the habit.

TOBACCO ECONOMICS

71-0177. Hedrick, J. L. **Cigarettes and the Economy.** *Bulletin National Tuberculosis and Respiratory Disease Association* 57(1):9-10, January 1971.

The importance of tobacco production to the southeastern economy and how tobacco is grown, harvested and cured are briefly described. It is pointed out that the manufacturers of tobacco products have not been affected much by the recent downward trend in tobacco consumption, since they have diversified into new businesses. It is the tobacco farmer, faced with rising production costs, less demand, small government acreage allotments and changes in tobacco processing requiring less tobacco per cigarette, who is caught in the price-cost squeeze. Attempts are being made to develop a less hazardous tobacco and better filter and design characteristics to reduce the hazards of the cigarette itself.

BILLS AND LEGISLATION

71-0178. Lancet. **Tobacco and Snuff Bill.** *Lancet* 2(7687):1368, December 26, 1970.

Great Britain's proposed Tobacco and Snuff Bill would require health warnings and tar and nicotine contents printed on all tobacco product containers and packages, and would ban all advertising by all media of all tobacco products.

71-0179. Nature. **Clouds of Smoke, Confusion and Oblivion.** *Nature* 229(5280):75-76, January 8, 1971.

Various methods for curtailing the consumption and sale of tobacco in Great Britain are briefly examined, including a higher tobacco tax, warnings on all tobacco products, a more extensive ban on tobacco advertising, removal of cigarette vending machines from public places, higher fees for licenses to sell tobacco, state-controlled tobacco stores and increased antismoking advertisements. The problem of indifference to law if tobacco smoking were illegal is mentioned.

SMOKING CESSATION METHODS

71-0180. Bridel, D. A. **Les Produits Anti-Nicotine ou Anti-Tabac. [Anti-Nicotine or Anti-Tobacco Products.]** *Schweizerische Apotheker Zeitung* 108(23):903, November 19, 1970, French.

Three categories of pharmaceutical agents developed to help overcome the tobacco habit are briefly reviewed. Those with a lobeline base are Banton, Lobidan, and Tabusine; they act on the respiratory system and replace the nicotine present in the tissues of the smoker so the lack of nicotine is not perceived. This first category of products is not habit forming. Another category is prepared from a silver nitrate base (e.g., Nosmoke, Omozone, Pastaba, Nicot-exsin). These irritate the mucosa and thus have a deterrent effect on smokers. The third category, having a vegetable base, are of doubtful efficacy. Brand names are: Libbs, Nicocortyl, and Tabazero. The habit of smoking can be overcome only by will power. Some tricks to overcome the addiction include: hide all reminders of smoking, such as ashtrays; use the vacation period as a trial no-smoking period; and avoid the company of smokers.

GENERAL

71-0181. Cotterot, E., Rieckert, C., Daneyrolle, C., Eyraud, C. **Etude et Amelioration de l'Efficacite des Filtres de Cigarettes. [Survey and Improvement of Efficiency of Cigarette Filters.]** *Chimie et Industrie* 103(16):2035-2041, October 1970, French.

The efficiency of a cigarette filter towards a given component of tobacco smoke may be studied by frontal chromatography. It is established that the sorption of acrolein is a process of mere adsorption on active C, combined adsorption and absorption on fibrous cellulosic products. In this last case, the retention is improved by incorporating a swelling agent into the fibers. The amount of solute retained at steady state is not changed, on the contrary, its speed of diffusion in the solid is increased. (Auth. Abs.)

71-0182. Evang, K. **Tupakointi Terveyden Vaarana. [Smoking as a Health Hazard.]** *Suomen Laakarilehti, Finlands Lakartidning* 24:3108-3111, 1969, Finnish.

Studies have shown that lung cancer, laryngeal cancer, thrombosis, angina pectoris, chronic bronchitis, lung deflation, reduced lung function, premature and underweight births, and stomach and duodenal ulcers occur more frequently in smokers than in nonsmokers. Despite the evidence, it has had only short-lived effects on the smoking habits of the public. In many countries, experiments are under way to raise the price of tobacco, to require health warnings on tobacco products, to ban tobacco advertising and to educate children and youth. Demands are also being made to decrease the acreage for growing tobacco, to set age limits for buying tobacco and to prohibit smoking in public vehicles. However, none of these measures will be effective as long as smoking is socially acceptable.

71-0183. Silvers, D. **In Southwestern Virginia, Students Set Up Antismoking "Teach-ins" – 207 of Them.** *Bulletin National Tuberculosis and Respiratory Disease Association* 56(11):9-10, December 1970.

An antismoking education program is briefly described which used 38 high school student speakers to conduct 207 antismoking sessions for over 6000 elementary grade students. Presentations were given to 30 students at a time and involved slides, films, felt board displays, Smoking Sam mannikins (to demonstrate tar accumulation) and question-and-answer periods.

71-0184. Terry, L. L. **So Little Done . . . and So Much To Do! From the NTRDA Annual Meeting Session on Cigarette Smoking.** *Bulletin National Tuberculosis and Respiratory Disease Association* 56(11):13-14, December 1970.

Comments are presented on the efforts on the antismoking campaigns, some new information on the effects of smoking, the importance of focusing antismoking efforts on the youth, the decreasing consumption of cigarettes and its consequences, and the antismoking efforts of the voluntary health agencies.

CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-0185. Altland, P. D., Brubach, H. F., Parker, M. G., Dieter, M. P., Murayama, M. **Effects of Smoke on Tolerance of Rats to Hypoxia.** *Journal of Applied Physiology* 30(3):352-357, March 1971.

All rats survived 4-hour exposure to tobacco smoke (nicotine <1.8 mg/cigarette, carbon monoxide 0.045 percent) or corn silk smoke (no nicotine, CO 0.031 percent) in 20.9, and in 11.8 percent O_2. The mortality of rats in tobacco smoke was greater than in corn silk smoke in 10.4, 8.3, and 6.6 percent O_2. This difference was attributed to higher COHb saturations and to nicotine in the tobacco smoke. Rats exposed to 0.045 percent CO in 8.3 percent O_2 without smoke had a higher survival than rats exposed to tobacco smoke in 8.3 percent O_2 though COHb concentrations were equivalent. Both types of smoke produced an immediate reduction in breathing rate in all O_2 concentrations, but 0.045 percent CO alone had no such effect. Hypothermia produced in rats by hypoxia was intensified only by exposure to tobacco smoke. Blood glucose and serum lactic acid values were higher in rats in tobacco than in corn silk smoke at all hypoxic levels. The critical O_2 concentration which produced "excess lactate," an index of anaerobic metabolism, was 6.6 percent O_2 without smoke, 8.3 percent O_2 in corn silk smoke, and 10.4 percent O_2 in tobacco smoke. (Auth. Abs.)

71-0186. Balint, J. A., Bondurant, S., Kyriadkides, E. C. **Lecithin Biosynthesis in Cigarette Smoking Dogs.** *Archives of Internal Medicine* 127(4):740-747, April 1971.

The effects of acute exposure to cigarette smoke on the synthesis of lecithins in lung, pulmonary surfactant, heart, and liver were studied in anesthetized dogs after intravenous injection of $^{32}PO_4$, cholinemethyl-^{3}H and either methionine-methyl-^{14}C, ethanolamine-1-2-^{14}C, or palmitic acid-1-^{14}C. Control dogs and dogs exposed to heavy doses of smoke were anesthetized and ventilated with a positive pressure respirator through an endotracheal tube for 90 to 220 minutes after isotope injection. The pool size of lecithins was not changed by smoking, but statistically significant decreases in choline and phosphate incorporation were observed in the lecithins of lung and pulmonary surfactant and in the linoleoyl lecithin of the heart. No significant differences were noted in terms of isotope incorporation in liver, the phosphatidyl ethanolamines of any tissues, or in surface activity of lung extracts. (Auth. Abs.)

71-0187. Bartle, K. D., Novotny, M. **Mass Spectrometric and Gas Chromatographic Evidence for Some New Components in the Gas Phase of Tobacco Smoke.** *Beitrage zur Tabakforschung* 5(5):215-219, November 1970.

The gas phase of fresh tobacco smoke was injected onto an open-tubular gas chromatography column at low temperature. Mass spectra and retention data for components eluted on temperature programming suggest the presence of six new compounds: 1,1-, 1,2-*cis*-, and 1,2-*trans*-dimethylcyclopropanes; 1-chloro-5-methylhexane; 1,3,5-hexatriene; and 2-methyl-1-octene. (Auth. Abs.)

71-0188. Battig, K. **Differential Effects of Nicotine and Tobacco Smoke Alkaloids on Swimming Endurance in the Rat.** *Psychopharmacologia* 18(3):300-304, November 24, 1970.

The swimming endurance of rats in a water tub was measured until the animals submerged for two seconds under the water surface. The total alkaloid fraction extracted from cigarette smoke produced deterioration of performance in doses of 0.05 to 0.2 mg/kg, whereas pure nicotine (0.1 and 0.2 mg/kg), as well as nicotine pretreated analogously to the extraction process of the total alkaloids, produced performance improvements. (Auth. Abs.)

71-0189. Bhagat, B. **Influence of Chronic Administration of Nicotine on the Turnover and Metabolism of Noradrenaline in the Rat Brain.** *Psychopharmacologia* 18(4):325-332, 1970.

Chronic administration of nicotine (0.5 mg/kg, subcutaneously, 3 to 5 times a day for 6 weeks) accelerated the rate of disappearance of intraventricularly administered ^{3}H-noradrenaline from rat brain. This was associated with normal levels of ^{3}H-normetanephrine suggesting an increase in intraneuronal deamination. The rate constant of amine decline in animals chronically treated with nicotine was significantly greater than that of controls while the steady state level of brain noradrenaline was about equal in both groups of rats. Amphetamine, reserpine, acetylcholine, histamine, pheniprazine, pargyline and nicotine affected the catecholamine levels in the rat brain treated with nicotine to the same degree as they did in the controls. It is concluded that chronic administration of nicotine may increase noradrenaline turnover in the brain and possibly increase the deamination of this amine. (Auth. Abs.)

71-0190. Burke, D. H., Mann, D. E. (Jr.) **Influence of Several Autonomic Drugs on Sodium Nitroprusside and Oxotremorine-Induced Hypothermia in Immature and Mature Mice.** *Journal of Pharmaceutical Sciences* 59(12):1814-1818, December 1970.

Sodium nitroprusside and oxotremorine each produced body temperature depression that was independent of age. Atropine inhibited oxotremorine hypothermia in both age groups, but was ineffective in modifying thermal responses to nitroprusside in both age categories. Pilocarpine administration did not alter oxotremorine activity at either age level, while nitroprusside hypothermia was enhanced and partially reversed, respectively, in immature and mature mice. Nicotine and tetraethylammonium chloride were unable to modify hypothermia produced by oxotremorine and nitroferricyanide in adult mice. Nicotine enhanced nitroprusside hypothermia in 10-day-old mice, while temperature depression due to oxotremorine was unaffected in the same age group. Administration of tetraethylammonium chloride to immature animals treated with oxotremorine and nitroprusside resulted in greater temperature depression. Chlorpromazine, which produced no change in oxotremorine or nitroprusside hypothermia in 10-day-old mice, partially blocked oxotremorine-induced hypothermia in mature animals; the weak parasympatholytic phenothiazine produced no significant difference in hypothermia when given prior to nitroprusside in the adult group. (Auth. Abs.)

71-0191. Chyle, P., Chyle, M., Patocka, F. **Virus Tabakove Mozaiky a Polyfenoly Jako Prirozene se Vyskytujici Kancerogeny v Tabaku. [Tobacco Mosaic Virus and Polyphenols as Naturally Occurring Carcinogens in Tobacco.]** *Casopis Lekaru Ceskych* 110(8):189-190, February 19, 1971, Czech.

It was found that tobacco mosaic virus is present in the majority of tobacco products. Infectious virus is transported via the smoke even into the respiratory tract of other persons. The higher carcinogenic activity of Virginia type tobaccos may be due to the fact that they are not fermented but flue-cured and thus TMV and all the phenolic compounds are preserved in them. Most likely the oncogenic effect of tobacco is due to the synergistic action of polyphenols and various viruses in the animal cell. (Auth. Abs.)

71-0192. Dalhamn, T., Rosengren, A. **Effect of Different Aldehydes on Tracheal Mucosa.** *Archives of Otolaryngology* 93(5):496-500, May 1971.

In connection with investigations of the ciliostatic effect of tobacco smoke, aldehydes have been of special interest as many of them have an irritating effect on the tracheal mucosa. A comparison of the ciliostatic effect of formaldehyde, acrolein, acetaldehyde, crotonaldehyde, and methacrolein shows that there are significant differences between the substance's regression lines. Formaldehyde seems to be the most toxic substance followed by acetaldehyde and acrolein. Crotonaldehyde and methacrolein have the weakest slope. The technique for observing the tracheal ciliary activity is the *in vitro* technique which has been used in many other investigations. (Auth. Abs.)

71-0193. Dontenwill, W., Harke, H.-P., Baars, A., Goertz, E. **Experimentelle Untersuchungen uber Aufnahme und Ablagerung von Rauchbestandteilen bei der passiven Berauchung von Goldhamstern mit Zigarettenrauch. [Experimental Studies on Intake and Deposition of Smoke Particles in Golden Hamsters When Exposed to Cigarette Smoke.]** *Arzneimittel-Forschung* 21(1):142-143, January 1971, German.

Labeling cigarette smoke with n-hexadecane/n-hexadecane-1-^{14}C makes the measurement of smoke intake and smoke distribution during passive smoke exposure of Syrian golden hamsters possible. Investigations show that the nasal clearance removes less than 50 percent of the smoke particles. The highest amount of deposited particles per surface unit was found in the respiratory tract in the area of the larynx, and therefore, the intensity of histopathological findings in this region is understandable. (Auth. Abs.)

71-0194. Estler, C.-J., Heim, F., Ammon, H.P.T., Zimmermann, V. **Catecholamine-Independent Glycogenolysis in Brain During Carbon Monoxide Poisoning.** *Pharmacology* 5(1):55-63, 1970.

In carbon monoxide poisoned mice enhanced glycogenolysis and lactate production in the brain are not prevented by pretreatment of the animals with reserpine or an adrenergic β-receptor blocking agent (Ko 592). Since, furthermore, glycogenolysis is not accompanied by changes in the phosphorylase a content or phosphorylase a/phosphorylase (total) ratio, it becomes unlikely that adrenergic mechanisms play a major role in the stimulation of carbohydrate breakdown during carbon monoxide poisoning. It appears more likely that by analogy to the condition in heart glycogenolysis is stimulated by an activation of phosphorylase b due to changes in the concentration of metabolites which are known to inhibit (ATP, glucose-6-phosphate) or activate (AMP, inorganic phosphate) phosphorylase b. (Auth. Abs.)

71-0195. Estler, C.-J., Ammon, H.P.T., Heim, F. **Metaboliten des Kohlenhydratstoffwechsels und energiereiche Phosphate im Gehirn weisser Mause nach wiederholter Kohlenmonoxydvergiftung. [Metabolites of Carbohydrate Metabolism and High-Energy Phosphates in the Brain of Mice After Repeated Carbon Monoxide Poisoning.]** *Archiv Fur Toxikologie* 27(2):124-128, 1971, German.

The influence of single (4 hours) or repeated (35 times, 9 hours plus once for 4 hours within a period of 7 weeks) exposure to 0.1 percent (v/v) carbon monoxide in air on the glycogen, pyruvate, lactate, ATP and phosphocreatine content of the brain and on the blood glucose level was investigated in mice. By a carbonmonoxyhemoglobin concentration of 35 percent after a single exposure to carbon monoxide, the pyruvate content of the brain was found to be increased and the blood glucose level decreased. After 7 weeks of repeated exposure, additional changes found by the same CO-Hgb content included an increase in the lactate and a decrease in the phosphocreatine content of the brain. The changes produced by repeated carbon monoxide poisoning were found to be only partly reversible after the animals were subsequently allowed to breathe normal air for 15 hours. (Auth. Abs.)

71-0196. Fazekas, L. G., Kosa, F. **Uber histologische Veranderungen bei akuter Nikotinvergiftung. [Histological Changes in Acute Nicotine Intoxication.]** *Zacchia; Archivo di Medicina Legale, Sociale e Criminologica* 6(2):200-218, April-June 1970, German.

Among the post-mortem material of the Medico-legal Institute at Szeged University for the years from 1921 to 1968, there are 46 cases of acute nicotine intoxication. In 34 of them, the organs (various regions of the brain, spinal cord, heart, lungs, spleen, liver, kidneys, stomach, small and large intestine) have been histologically examined. The histological changes observed in acute nicotine intoxication can be attributed, in part, to the shock due to the accentuation of the activity of the sympathico-adrenalinic system. They are revealed above all by a modification of the blood distribution (agglutination with concentration of the embolic type of the leucocytes in the arteriole lumen, loosening of the endothelium cells and their well visible accumulation in the single, sections, poverty of blood and cell elements in the spleen, increase of lymphoreticular elements in the lumen of the arteries and the veins of the spleen), by changes of the hematological picture (inversion of the normal neutrophil-lymphocyte ratio), thickening of the arterial walls of a muscular type with reduction of their lumen, prominence of the intima into the vasal lumen, shrinking of the membrana elastica interna and its dissociation, stasis in the capillary vessels and the veins and perivascular hemorrhages in the phylogenetically most ancient cerebral territories. The following direct destructive effects in relation to the toxic action of nicotine can be observed: mobilization of the hepatic cells, loosening of the alveolar epithelia, as a result of the high degree pulmonary hemorrhagic edema, necrosis of the epithelia in the renal tubuli, loosening and dissociation of the epithelia in the tubuli contorti of the second degree, lipofuscinic deposits in the plasma of the cardiac cells, as well as large changes caused by concentration of the myofibrillae of the cardiac muscle. (Auth. Abs.)

71-0197. Federation of American Societies for Experimental Biology. Life Sciences Research Office. **A Review of the Biomedical Effects of Marihuana on Man in the Military Environment.** Prepared for Life Sciences Division, Army Research Office, Office of the Chief of Research and Development, Department of the Army, Washington, D.C. under Contract No. DAHC19-71-C-0006, AD-718083, December 1970, 101 pp.

This review documents in detail the current state of knowledge of the effects of marihuana on man. The study examines the relationships between marihuana use and performance of the man in a military environment and identifies opportunities for future research by the Army in this field. The scope of the study includes the botany and phytochemistry of *Cannabis sativa*, isolation, characterization, and synthesis of the plant constituents, the pharmacology of these compounds, and the need for quantitative estimation of the tetrahydrocannabinols and their derivatives in biological samples. Special attention is directed to the effects of smoking marihuana, the composition of marihuana cigarette smoke, and the resulting somatic, subjective, perceptual, and cognitive changes that may influence the performance of the smoker. This review includes a description of behavioral tests used to measure marihuana effects, the influence of an individual's expectations, and effects of environmental setting on human subjects. The anecdotal literature on marihuana is being replaced by reports of controlled laboratory studies; however, investigations that measure performance in real-life situations are required to answer crucial military questions on marihuana effects. Information on the chemistry, pharmacology, and behavioral effects of marihuana that is necessary for these future studies is being developed at the present time. The report identifies and assesses the research opportunities that are related to the requirements of the Army. It is suggested that the unique research experience and facilities of the Army in assessing the performance abilities of men exposed to incapacitating agents may be utilized to answer the pressing questions concerning marihuana smoking and its influence on the performance of the man in the military environment. Suggestions for future research are outlined. (Auth. Abs.)

71-0198. Flint, G. L., Maxwell, K. W., Renzetti, A. D. (Jr.) **Influence of Cigarette Smoke on Guinea Pigs. Effect on Pulmonary Cells and Serum Antitrypsin Levels.** *Archives of Environmental Health* 22(3):366-369, March 1971.

A significant increase in the number of polymorphonuclear leukocytes recoverable from the lungs of guinea pigs has been demonstrated to occur in response to exposure to cigarette smoke. This increase was accompanied by no change in serum antitrypsin levels over the ten-week exposure period. These observations, if applicable to man, suggest that a source of proteolytic enzymes in relatively high concentrations may be continuously present in the lungs of cigarette smokers. The depressant effect of cigarette smoke on natural respiratory defenses leaves the system increasingly susceptible to bacterial infections and even greater inflammation results. When this is added to an already excessive number of leukocytes chronically present, the resultant concentration of proteolytic enzymes may be greater than can be counteracted by the available enzyme inhibiting agent. (Auth. Abs.)

71-0199. Graham, J.D.P., Suhaila, A., Tai, A. **Response to Acetylcholine and Nicotine of the Perfused Vessels of the Rabbit Ear.** *British Journal of Pharmacology* 41(3):500-506, March 1971.

The vessels of the isolated rabbit ear were perfused at 23 mbar with Krebs solution with (tonic) and without (atonic) noradrenaline (5.9×10^{-7}M) at selected temperatures of 20°-38° C. Peripheral resistance units (PRU) were calculated from the observed peak flow rates and alterations caused by drugs expressed as Δ percent PRU. Acetylcholine (ACh) is a constrictor in the atonic vessel. ACh is a vasodilator of the tonic vessel perfused with noradrenaline (NA). This effect is potentiated by anticholinesterase and by denervation, unaffected by botulinum toxin and antagonized by atropine. ACh also dilates the vessel perfused with vasopressin. Increasing the temperature reduces the responses to ACh but increases the effect of anticholinesterase. Nicotine causes a dose dependent dilatation of the tonic vessels, reduced but not abolished by hexamethonium (C_6) by atropine, by botulinum toxin and by denervation. Nicotine causes a dose dependent constriction of the atonic vessels, abolished by C_6 and by phentolamine, reduced by denervation, but unaffected by botulinum toxin. (Auth. Abs.)

71-0200. Graham, J. F. **Cigarette Smoke Analysis by Computer – GLC.** *Beitrage zur Tabakforschung* 5(5):220-228, November 1970.

A two-stage GLC system has been developed to produce a separation of cigarette smoke "semi-volatiles" into several hundred peaks per analysis. Quantitative measurements of the separated peak areas, with correction for baseline drift and an internal standard value, are made by an off-line computer, using a digital output obtained from the GLC system on punched tape. The main features of the computer program used are described, and typical output data are shown. Results of analyses dealing with cigarette smoke composition, and the selective effect of various filters, are presented. The use of neophytadiene as reference compound for the selectivity calculations is described. (Auth. Abs.)

71-0201. Groenen, P. J. **Chemische Aspecten van Sigarettenrook. [Chemical Aspects of Cigarette Smoke.]** *Jaarboek Kankeronderzoek en Kankerbestrijding* 19:65-75, 1971, Dutch.

The physico-chemical properties of smoke and the standardized machine-smoking of cigarettes are briefly discussed. A survey is given of the constituents of cigarette smoke, which on the basis of animal experiments or theoretical considerations are thought to be possibly involved in the genesis of various forms of cancer in man, or in promoting them. Some recent controversial developments in smoke analysis are described, such as: the importance of volatile smoke constituents, which in animal experiments are often removed from the condensates before application; the possible presence of nitrosamines; the role of *alpha-beta* unsaturated lactones and other unsaturated carbonyl compounds. Acetic aldehyde, a major cigarette smoke constituent, is also touched upon. Special attention is drawn to those compounds in smoke that might be collectively characterized as thiolophilic or mercaptophilic. Finally, the influence of the tobacco varieties, incorporated in cigarettes, on smoke composition and on inhalation habits of smokers, is discussed.

71-0202. Guerin, M. R., Shults, W. D. **Tobacco Smoke Analysis Program Progress Report for the Period January 1, 1970, to September 1, 1970.** Oak Ridge National Laboratory, U.S. Atomic Energy Commission, Oak Ridge, Tennessee, Report No. ORNL 4642, January 1971, 207 pp.

The Tobacco Smoke Analysis Program is establishing chemical assays and applying them to the smokes of a series of 23 experimental cigarettes to provide information to better define the relationship between cigarette characteristics and experimental tobacco carcinogenesis. During this period, cigarettes were smoked and the generated particulate matter was analyzed to determine the tar and nicotine deliveries of all the experimental cigarettes. The data were studied in detail to provide measures of the facility's ability to generate precise, meaningful results and to allow ranking the experimental cigarettes according to their deliveries of particulate matter. Acetaldehyde and acrolein were determined in the gas phases of the cigarettes. The formaldehyde and hydrogen cyanide contents of the gas phases are presently being determined. Research and development activities emphasized support of the routine operations. One result of these activities is an analytical system capable of excellent precision in the simultaneous determination of acetaldehyde and acrolein. Studies of the gas chromatographic properties of nicotine, nornicotine and monohydric phenols greatly facilitated the selection of chromatographic conditions for the routine analyses of these compounds. The application of a liquid chromatograph to the separation of phenanthrene, benz(*a*)anthracene and benzo(*a*)pyrene suggests the possibility of greatly shortening the time required for the determination of these polycyclic hydrocarbons in condensates. A consideration of the characteristics of the cyanide-specific electrode suggests a superior approach to the determination of the hydrogen cyanide delivery of cigarettes. Experience with porous-polymer gas chromatography facilitated the development of means for the determination of water in particulate matter, water and acetone in condensates, and suggested the possibility of determining formaldehyde gas chromatographically. Activities with selective-detectors in gas chromatography suggested a possible system for the determination of oxides of nitrogen in the gas phase of smokes. Work in areas less directly related to the routine operations also produced promising results. A study of the polarographic properties of N-nitrosamines suggests the possibility of the electrochemical determination of the N-nitrosamines in condensates. Trimethylsilylation of pyridine solutions of cigarette smoke condensate allowed the reproducible generation of gas chromatograms displaying more than thirty of the major constituents of whole condensate in less than one hour. The direct application of a flame photometric detection system to the gas chromatography of the gas phase of cigarette smoke allowed the visualization of hydrogen sulfide, carbonyl sulfide, carbon disulfide, thiophene and ten other sulfur-bearing smoke constituents in fractions of a puff of smoke. (Auth. Abs. Mod.)

71-0203. Hoffmann, D., Wynder, E. L. **A Study of Tobacco Carcinogenesis. XI. Tumor Initiators, Tumor Accelerators, and Tumor Promoting Activity of Condesate Fractions.** *Cancer* 27(4):848-864, April 1971.

The neutral portion of cigarette smoke condensate, its fraction B, and subfraction BI are the only portions of cigarette smoke condensate which are active as carcinogens and tumor initiators. BI amounts to about 0.6 percent of dry "tar" and contains polynuclear aromatic hydrocarbons (PAH), *N*- and *O*-heteroaromatic compounds, chlorinated insecticides, and some of their pyrolysis products, esters, terpenes, and quinones. Heretofore, 12 known carcinogens and several tumor accelerators have been identified. BI was separated into 5 portions. The active portion (BIh, 0.09 percent) was chromatographed into 80 subfractions. BIh 55-56 were highly active as tumor initiators, but did not contain known carcinogens; BIh 71-78 contained known as well as unidentified carcinogens. Such alkylated PAH, as alkylated fluoranthenes, cyclopentaphenanthrenes, and chrysenes, are present in significant concentration in the active BIh subfractions. Of all tobacco "tar" fractions, only the acidic portion showed significant tumor promoting activity. (Auth. Abs.)

71-0204. Ingenito, A. J., Barrett, J. P., Procita, L. **An Analysis of the Effects of Nicotine on the Cerebral Circulation of an Isolated, Perfused, *In Situ* Cat Brain Preparation.** *Stroke* 2(1):67-75, January-February 1971.

To determine the effects of nicotine HCl on the cerebral circulation of the cat, without the complicating actions of the drug at other sites in the body, the drug was perfused at concentrations of 1, 10 and 100 micrograms/ml through a vascularly isolated, perfused *in situ* cat brain preparation. Cats having selective section of cranial nerves 9, 10, 11 and 12 and the cervical sympathetic trunks comprised various experimental groups. Nicotine was also perfused through an isolated, denervated hindlimb of the same cat for comparative purposes. Nicotine caused only a mild and transient vasoconstriction of the cerebral circulation, mediated primarily by stimulation of the superior cervical ganglia, and a small direct cerebral vasoconstrictor component. An acute tolerance to the cerebral vasoconstrictor effects of repeated increments of nicotine was also observed. The cerebral vasoconstrictor effect of nicotine was diminished in the presence of intact vagi, suggesting a cerebral vasodilator role for these nerves. In contrast, the effect of nicotine on the denervated hindlimb vasculature was a weak but sustained vasodilation. The mechanism of action of nicotine on the cerebral circulation is discussed along with the relevance of these findings to the potential health hazards of tobacco smoking in individuals with cerebrovascular insufficiency. (Auth. Abs.)

71-0205. Inoki, R., Kojima, S., Tamari, Y., Yamamoto, I. **Effects of Nicotine on Salivary Amylase Secretion From Rabbit Parotid Gland.** *British Journal of Pharmacology* 41(2):285-293, February 1971.

The effects of nicotine on amylase secretion induced by auriculo-temporal nerve stimulation were studied. Nicotine caused a transient increase in secretion as well as flow rate of amylase. No difference in nicotine action was found between acute sympathetic decentralization of the gland and acute denervation. The increase in amylase secretion due to nicotine was not inhibited by phenoxybenzamine, bretylium and chronic denervation, but was prevented by hexamethonium, propranolol and adrenalectomy. The increase in flow rate due to nicotine was not inhibited by propranolol, chronic denervation and adrenalectomy, but was prevented by hexamethonium, phenoxybenzamine and bretylium. These results show that the action of nicotine in increasing amylase secretion is neither a direct action on the ganglion nor on the nerve terminal of the cervical sympathetic nerve, but is an indirect action of catecholamines released from the adrenal medulla on the post-junctional receptors. The study also suggests that the initial acceleration of salivary flow due to nicotine is characterized by a mechanism different from that of amylase secretion. (Auth. Abs.)

71-0206. Jacobs, L., Sampson, S. R., Comroe, J. H. (Jr.) **Carotid Sinus Versus Carotid Body Origin of Nicotine and Cyanide Bradycardia in the Dog.** *American Journal of Physiology* 220(2):472-476, February 1971.

When cyanide (50 micrograms) or nicotine (5 micrograms) was injected into the common carotid arteries of dogs anesthetized with chloralose, reflex bradycardia occurred; this bradycardia was most striking when the reflex tachycardia initiated by lung inflation was prevented by paralyzing the dog with succinylcholine and stopping the respirator immediately before making an injection. After selective surgical denervation of the carotid sinus in six dogs, cyanide or nicotine, in the doses previously used, still produced a marked bradycardia. After surgical denervation of the carotid body alone, the same doses of these chemicals had no effect on heart rate. Cyanide or nicotine, in doses which caused hyperpnea and bradycardia before section of the carotid nerve, never elicited a prompt increase in electrical activity in 21 carotid baroreceptor fibers. Because cyanide and nicotine still elicit bradycardia after the carotid sinus fibers are cut and the carotid body is intact, but do not do so when the carotid body is denervated and the carotid sinus is intact, this bradycardia must originate in the carotid body chemoreceptors. (Auth. Abs.)

71-0207. Joyet, G. **The Thorium-Series in Cigarettes and in Lungs of Smokers.** *Experientia* 27(1):85-89, January 15, 1971.

The gamma-spectrum of several brands of cigarettes were measured to determine their thorium content. The thorium weight for 9000 cigarettes, which corresponds to the annual amount consumed by a smoker of 25 cigarettes/day, ranged from 9 to 36 mg. In gamma-spectrum measurements of the chests of 10 smokers and 2 nonsmokers, 5 smokers showed a thorium content from 1.7 to 2.4 ± 0.6 mg.

71-0208. Judd, H. J. **Levels of Carbon Monoxide Recorded on Aircraft Flight Decks.** *Aerospace Medicine* 42(3):344-348, March 1971.

This paper reviews the toxicology of carbon monoxide, points out the essential meteorological conditions under which this becomes of practical importance, and demonstrates the significance of pressurization, tobacco smoking, and the results of carbon monoxide levels recorded on the flight decks of assorted jet aircraft under normal operational conditions. The object of this study was to attempt to outline any potential dangers arising from carbon monoxide on aircraft flight decks. The results obtained in the present series of tests are not conclusive, but the prevailing conditions at the time were not likely to give rise to high concentrations of carbon monoxide. In addition, little is known regarding the levels of carboxyhemoglobin in air crews prior to boarding the aircraft as a result of exposure to general atmospheric pollution and smoking of tobacco. (Auth. Abs. Mod.)

71-0209. Kaminski, E. J., Lazanas, J. C., Wolfson, L. L., Fancher, O. E., Calandra, J. C. **Fate of Aflatoxins in Cigarette Tobacco.** *Beitrage zur Tobakforschung* 5(4):189-192, August 1970.

Commercial nonfilter cigarettes were treated with 100 micrograms or 300 micrograms of aflatoxin B_1 and smoked in a smoking machine. The 25-mm butts, the particulate phase of smoke collected on Cambridge filters, the gaseous phase of smoke, and the ashes combined from 10 cigarettes in each experiment, were tested for the presence of aflatoxins by TLC and spectrophotofluorometry. In six separate smoking experiments, no trace of aflatoxin B_1 could be detected in any of the fractions examined. The crystalline aflatoxin B_1 used in these experiments was prepared by growing cultures of *Aspergillus flavus* on rice. The acute oral LD_{50} (12 days) in weanling rats was 7.5 mg/kg and the acute oral LD_{50} (7 days) in one-to-three-day old white Pekin ducklings was 0.78 mg/kg ± 0.30 mg/kg. The melting point of aflatoxin B_1 was 263-264° C, and the molar extinction coefficient was 25,000 and 13,400 at wave lengths of 361 millimicrons and 265 millimicrons, respectively. The fluorescence excitation and emission wave lengths were 363 millimicrons and 423 millimicrons, respectively. (Auth. Abs.)

71-0210. Maehly, A. C., Swensson, A. **Cyanide and Thiocyanate Levels in Blood and Urine of Workers With Low-**

Grade Exposure to Cyanide. *Internationales Archiv fur Arbeitsmedizin* 27:195-209, 1970.

The concentrations of free cyanide in the blood and in the urine, and the levels of "free" thiocyanate (oxidized to cyanide and distilled) as well as "total" thiocyanate (directly determined and quite unspecific) were determined in the urine of 140 volunteers. There were four main categories of volunteers: (1) nonsmokers, not exposed to cyanide in the atmosphere, (2) smokers, not exposed to cyanide, (3) nonsmokers, exposed to various levels of cyanide in their occupation, and (4) smokers who were also exposed to cyanide. The cyanide concentration in the blood did not show a clear relationship to either smoking or moderate occupational exposure; the levels were found to lie between 2.0 and 15.0 micrograms of free cyanide per 100 ml of blood, with an average of 5.4 micrograms for all categories of volunteers. It was found that the individual concentrations of free CN' and CNS' in the urine varied considerably and could not be used for detecting undue chronic exposure to cyanide at the concentrations encountered in the atmosphere. The average values, on the other hand, varied in a regular pattern for each of the four categories listed above. The influence of smoking had a far greater effect on the values obtained than the influence of atmospheric cyanide. Because of the great variations caused by other factors, concentrations of CN' and CNS' in the urine are not appropriate tools for individual routine control of minor occupational exposure to cyanides. However, nonsmokers exposed to moderate cyanide levels in the air, and any individual exposed to high cyanide levels show higher than average values of CN' and CNS' in their urine. The cyanide values reported in this paper may be useful for the evaluation of analytical results from individual cases where poisoning from cyanide in the atmosphere is suspected. (Auth. Abs.)

71-0211. Meyer, D. H., Cross, C. E., Ibrahim, A. B., Mustafa, M. G. **Nicotine Effects on Alveolar Macrophage Respiration and Adenosine Triphosphatase Activity.** *Archives of Environmental Health* 22(3):362-365, March 1971.

Pulmonary alveolar macrophage cells (PAMs) manifest a high endogenous respiration (0.16 micromols/liter of O_2 per milligram of protein per second) and a Mg^{++} dependent Na^+, K^+ stimulated adenosinetriphosphatase (ATPase) activity at the cellular level (2.2 micromols of phosphate per milligram of protein per hour). Nicotine adversely affected the PAM respiration and ATPase systems. Concentrations above 0.5 millimols/liter inhibited PAM ATPase activity; a 33 percent inhibition occurred at 5 millimols/liter of nicotine. Preincubation exposure of PAMs to nicotine for one to two hours deteriorated the ATPase system further; a 50 to 60 percent inhibition occurred at 5 millimols/liter of nicotine. Low concentrations of this alkaloid (<5 millimols/liter) stimulated cell respiration by 20 percent; high concentrations (>10 millimols/liter) were inhibitory. Preincubation of cells for one to four hours in the presence of 0.1 to 5.0 millimols/liter of nicotine caused abolishment of biphasic response and greater respiratory inhibition. (Auth. Abs.)

71-0212. Orsingher, O. A., Fulginiti, S. **Effects of Alpha-Methyl Tyrosine and Adrenergic Blocking Agents on the Facilitating Action of Amphetamine and Nicotine on Learning in Rats.** *Psychopharmacologia* 19(3):231-240, February 16, 1971.

DL-amphetamine sulphate (2 mg/kg) and nicotine (0.2 mg/kg) showed a facilitatory action on the acquisition of a conditioned response in a shuttle-box by rats and this was reversed by pretreatment with *alpha*-MT (30 mg/kg). Pretreatment with dibenamine (10 mg/kg) impaired the action either of amphetamine or nicotine. Nethalide (5–10 mg/kg) exerted a partial protection on the depressant effect produced by the interaction between dibenamine and nicotine. Animals treated with *alpha*-MT (30 mg/kg) and kept in the cold (4–6° C for 3 h) also showed a depressed learning capacity. DL-Dopa (200 mg/kg) provided a partial protection on the depressive effects caused by the interaction of *alpha*-MT with amphetamine, nicotine or cold. It is suggested that the facilitatory learning action of amphetamine and nicotine involves a common adrenergic mechanism. The depressant effects of amphetamine, nicotine or cold after *alpha*-MT treatment are attributed to depletion of "functional pools" of catecholamines. (Auth. Abs.)

71-0213. Papacostas, C. A., Jackson, A. F. **Pressor Action of Nicotine Following 'Reversal' During Alpha Adrenergic Blockade.** *Pharmacological Research Communications* 2(3):257-266, September 1970.

In anesthetized, atropinized dogs which have received a high dose of the alpha adrenergic blocking agent, phenoxybenzamine, nicotine salicylate 0.2 mg/kg i.v. induces a blood pressure reversal which is followed by a relatively long lasting pressor response ranging in magnitude from 10 to 65 mm Hg. The latter response is characterized by a decreased heart rate and cardiac output and a marked increase in total peripheral resistance. The pressor effect can be completely blocked by the adrenergic neuron blocking agent, guanethidine. Endogenous catecholamines do not appear to be directly responsible for the response. Several other possible mechanisms are discussed. These include the spare alpha receptor hypothesis, release of serotonin or vasopressin, and activation of the renin-angiotensin system. (Auth. Abs.)

71-0214. Pappano, A. J., Rembish, R. A. **Nicotine-Induced Restoration of Action Potentials to Cardiac Tissue Depolarized by Potassium.** *Life Sciences* 9(24):1381-1388, December 15, 1970.

The results of the study indicate that nicotine retains its sympathomimetic activity under conditions in which the membrane potential of intracardiac adrenergic stores (sympathetic neurons and/or chromaffin cells) had been depolarized by elevation of the external potassium ion concentration. The features of the proposed mechanism by which nicotine releases catecholamines within the heart are in general agreement with the hypothesis advanced for nicotine-induced release of adrenal medullary catecholamines.

71-0215. Pradhan, S. N., Bowling, C. **Effects of Nicotine on Self-Stimulation in Rats.** *Journal of Pharmacology and Experimental Therapeutics* 176(1):229-243, January 1971.

Rats were trained to press a lever to receive intracranial electric stimulation through a stereotaxically implanted bipolar electrode in two different areas of the hypothalamus. Nicotine was given i.p. at several dose levels (12.5-400 micrograms/kg; base). The effects of nicotine were found to be rate-dependent. Facilitation of responding for self-stimulation was observed at 37.5 micrograms/kg and higher doses of nicotine in rats with low response rates. In rats with high response rates, nicotine had very little effect or even caused depression. However, when the rates were lowered in such rats by reducing current intensity or after prolonged lever pressing, a facilitatory effect of nicotine was demonstrable. Nicotine had no appreciable effect on unreinforced responses and it counteracted the depressant effect of barbiturates on self-stimulation. The facilitatory effect of nicotine on self-stimulation resembled that of amphetamine in many respects. Facilitation of self-stimulation by nicotine was reduced or blocked by mecamylamine, a tertiary ganglion blocking agent, and could not be produced in animals treated with reserpine 24 hours earlier. It is proposed that nicotine, by acting on a central nicotinic-cholinergic receptor, may indirectly cause release of norepinephrine which, in turn, produces the facilitatory effect on self-stimulation. (Auth. Abs.)

71-0216. Rosecrans, J. A. **Effects of Nicotine on Behavioral Arousal and Brain 5-Hydroxytryptamine Function in Female Rats Selected for Differences in Activity.** *European Journal of Pharmacology* 14(1):29-37, March 1971.

The effects of various doses (s.c.) of nicotine (200, 400 and 800 micrograms/kg) on exploratory behavior and forebrain 5-hydroxytryptamine (5-HT) metabolism were studied in female rats selected for differences in spontaneous activity. The results of this study indicated that nicotine affected each activity group differently; high activity rats (H.A.) appeared more susceptible to the chemical effects of nicotine (200 and 400 micrograms/kg) as 5-HT accumulation in pargyline monoamine oxidase inhibitor (MAOI) treated rats was significantly reduced, while low activity (L.A.) rats appeared more susceptible to behavioral stimulation due to nicotine (200 and 800 micrograms/kg). The 400 micrograms/kg dose, which induced both a maximal facilitation of arousal levels and a significant reduction of 5-HT accumulation was studied in greater detail, and was observed to initiate similar effects following repeated doses. However, in acute situations nicotine appeared to modulate behavior as evidenced by a stimulation of behavior in L.A. rats and a depression in the H.A. animal. Further chemical correlation studies indicated that nicotine (400 micrograms/kg) reduced 5-HT turnover (as measured using the MAOI, pargyline) to a greater extent in the forebrains of H.A. rats, while caudal (brainstem) areas were inhibited more in L.A. rats. This investigation presented evidence which indicated that the nicotine-induced elevation of arousal levels were correlated (at the 400 micrograms/kg dose) to an inhibition of 5-HT systems. While these data were essentially preliminary in nature, this study does give encouragement to the concept that nicotine's variable effects on the behavior of animals of different temperaments could be related to its effects on the forebrain 5-HT projection system. Furthermore, this study supports previous research in this laboratory which suggests that there may be a significant relationship between animal temperament and forebrain biogenic amine function. (Auth. Abs.)

71-0217. Schlotzhauer, W. S., Schmeltz, I., Osman, S. F. **Evidence for the Origin of Monoalkenes in Cigarette Smoke. (Letter)** *Chemistry and Industry* 43:1377-1378, October 24, 1970.

Observations on possible precursors for the pyrosynthesis of alk-l-enes, showed that tobacco leaf paraffins contribute to at least three classes of cigarette smoke constituents as a function of temperature: aromatic hydrocarbons formed by pyrosynthesis at the temperature of the burning cone (860° C); monoalkenes and lesser amounts of simple aromatic hydrocarbons produced at the lower temperatures behind the burning cone (650° C); and paraffins released into the smoke stream by distillation at an even lower temperature (450° C). The results substantiated that pyrolysis of materials possessing long carbon chains can give rise to alkenes at 650° C. Long chain alcohols may also play an important role in forming alkenes present in cigarette smoke.

71-0218. Silver, H. M. **Carbon Monoxide in Health and Politics.** *Medical Annals of the District of Columbia* 40(3):169-171, March 1971.

Carbon monoxide (CO) is a significant air pollutant which impairs oxygen delivery to the tissues with harmful effects, particularly in the central nervous system. The key elements in carboxyhemoglobin levels (COHB) are concentration of inspired CO and duration of exposure. Automotive exhausts contain approximately 3.5 percent CO while that of cigarette smoke is close to 2 percent, and inhaled smoked is 0.04 percent. A half-a-pack-a-day smoker averages 3.8 percent COHB, a two-pack-a-day smoker, 6.9 percent COHB. In the Washington, D.C. area, CO production which causes air pollution is almost exclusively automotive in origin and prospects for its regulation, through emission controls, automotive inspections and civic action, are hopeful. Abatement of air pollution is intertwined with the sociopolitical problems of this area and physicians may contribute to the solution by providing public information and participating in community action.

71-0219. Smit, H. **Die Wirkung einiger Feuchthaltemittel auf die Eigenschaften eines rohrengetrockneten Tabaks. [The Effect of Several Humectants on the Properties of a Flue-Cured Tobacco.]** *Beitrage zur Tabakforschung* 5(5):231-238, November 1970, German.

The water-vapor transmission of four polyhydric alcohols has been determined for the products themselves as well as after a 3-percent application on a flue-cured tobacco type. These polyhydric alcohols are glycerine, sorbitol, propanediol-1,2 and butanediol-1,3. The butanediol-1,3 shows the most hygroscopic properties. Of the four products examined, the same butanediol-1,3 has the strongest fungistatic effect. The taste of the cigarettes with butanediol-1,3 is better than that with sorbitol or propanediol-,1,2 (and diethyleneglycol). The smoke nicotine content of cigarettes, the tobacco of which is treated with 3 percent butanediol-1,3, is significantly lower than that of cigarettes out of the same type of tobacco with the other humectants or out of untreated tobacco. This can possibly be caused: a) partially by a relatively high moisture equilibrium of the tobacco; b) partially by a selective nicotine absorption in the butt (not in the filter);

and c) possibly there is still another effect, because the nicotine totals show a minimum with the glycol cigarettes; however, further experiments were not done. (Auth. Abs.)

71-0220. Stalhandske, T. **Effects of Increased Liver Metabolism of Nicotine on Its Uptake, Elimination and Toxicity in Mice.** *Acta Physiologica Scandinavica* 80(2):222-234, October 1970.

Male albino mice were injected intraperitoneally or intravenously with ^{14}C-labelled nicotine. Both untreated and phenobarbital pretreated mice were used. The concentrations of nicotine and metabolically formed cotinine were determined in the brain, liver and blood, 1, 2.5, 5, 10, 20 and 60 minutes after injection. It was found that phenobarbital pretreated mice exhibited an enhanced liver metabolism of nicotine *in vitro* and *in vivo*. The increased liver metabolism caused a significant decrease of nicotine concentration in the brain only when nicotine was given intraperitoneally. Phenobarbital pretreatment elevated the intraperitoneal LD_{50} value 2–3 times and also increased tolerance to repeated sublethal doses of nicotine. No change in the intravenous LD_{50} value was observed. (Auth. Abs.)

71-0221. Strudel, G. **Teratologie Experimentale. Action Teratogene du Sulfate de Nicotine sur l'Embryon de Poulet. [Experimental Teratology. Teratogenic Action of Nicotine on Chick Embryo.]** *Comptes Rendus Hebdomadaires des Seances de l'Acadamie des Sciences. Serie D: Sciences Naturalles* 272(4):673-676, January 25, 1971, French.

Nicotine sulfate injected into the yolk of a chick embryo incubated 48 hours chiefly induces malformations of the cervical vertebral column. The results indicate that the teratogenic agent exercises its action on the cord whose deformations then secondarily induce malformations of axial organs.

71-0222. Taira, N., Nakayama, K., Hashimoto, K. **Nicotinic Acetylcholine Receptors Subserving Nociception in the Dog Hindlimb.** *Japanese Journal of Physiology* 20(5):571-583, October 15, 1970.

Properties of nociceptors excited by acetylcholine in the hindlimb were investigated on conscious dogs utilizing vocalization as a measure of nociception. All compounds were administered into the femoral artery through a chronically indwelling catheter. Acetylcholine and two nicotinic compounds, nicotine and DMPP, produced vocalization, withdrawal or shaking of the hindlimb, biting and struggling. Three muscarinic compounds, bethanechol, methacholine and McN-A-343, failed to cause any sign indicative of nociception in the hindlimb even with large doses producing severe signs of generalized parasympathetic excitation. The nociceptive responses to acetylcholine were blocked by prior (1 to 2 min) administration of hexamethonium, tetraethylammonium, or DMPP in doses equal to those of acetylcholine, but not by comparable doses of *l*-hyoscyamine. The nociceptive responses to equi-effective doses of histamine or bradykinin were not affected either by any of these blockers. These results indicate that the afferent neuroreceptors which give rise to the nociceptive responses to acetylcholine administered into the femoral artery are nicotinic in nature. (Auth. Abs.)

71-0223. Turner, D. M. **Metabolism of Small Multiple Doses of (^{14}C) Nicotine in the Cat.** *British Journal of Pharmacology* 41(3):521-529, March 1971.

The distribution and metabolism of (2′-^{14}C) nicotine given as a series of small intravenous injections (4 micrograms/kg every 60 seconds for 20 minutes) have been studied in the cat. Blood concentrations of (^{14}C) nicotine reached a maximum of 100 ng/ml at 20 minutes whereas blood concentrations of cotinine were maximal shortly afterwards. The maximum concentration of nicotine in the blood was greater than that obtained by giving the same total dose as a continuous infusion ((4 micrograms/kg)/minute for 20 minutes). Urinary excretion accounted for 90 percent of the total multiple dose in 72 hours. After 24 hours, however, only 2.5 percent of the radioactivity as (^{14}C) nicotine and 0.05 percent as (^{14}C) cotinine was excreted. Gastric juice after two hours contained significant amounts of activity which was almost entirely composed of (^{14}C) nicotine and (^{14}C) cotinine. There were significant regional differences in the concentration of (^{14}C) nicotine in the brain; amounts were greatest in cerebral hemispheres and smallest in the spinal cord. The hypothalamus and thalamus contained significantly higher-concentrations of (^{14}C) nicotine than the whole mid-brain. (^{14}C) Cotinine concentrations were highest in the cerebellum. (Auth. Abs.)

71-0224. Victor, M. **Tobacco Amblyopia, Cyanide Poisoning and Vitamin B_{12} Deficiency.** In: Smith, L. (Editor). *Miami Neuroophthalmology Symposium.* Hallandale, Florida, Huffman Publishing Company, 1970, pp. 33-48.

The hypothesis linking vitamin B deficiency, cyanide poisoning and tobacco amblyopia is examined. Although experimental applications of cyanide have produced lesions of the optic nerves, these have been mild in degree and have occurred only in the presence of other cerebral lesions. The effects of the sublethal hypoxic insults of cyanide on the nervous system are not analogous to the effects of smoking and should not be used to support the idea that cyanide in tobacco smoke can damage the optic nerves. In examining the notion that cyanide in tobacco only damages the optic nerves in patients deficient in vitamin B_{12}, it is shown that the body contains a mechanism for detoxifying cynanide in tobacco that is effective and rapid, and largely independent of vitamin B_{12}. Nutritional deficiency is shown to be the one undoubted cause of so-called tobacco amblyopia. The best defined form of nutritional amblyopia is that due to vitamin B_{12} deficiency, but it is likely that other B vitamins and perhaps other nutritional factors produce the same pathological effect.

71-0225. Weiss, G. B., Rosecrans, J. A. **Alteration of 5-Hydroxytryptamine-^{14}C Uptake and Metabolism in Intestinal Smooth Muscle.** *European Journal of Pharmacology* 14(2):130-139, April 1971.

The effects of procaine, nicotine, 0°C, iodoacetic acid, and ouabain on the distribution and metabolism of

5-hydroxytryptamine-^{14}C (5-HT-^{14}C) in both guinea pig ileal longitudinal smooth muscle and taenia coli preparations were measured. Iodoacetic acid or 0°C (but not ouabain) consistently and markedly decreased both 5-HT-^{14}C and ^{14}C-labeled 5-hydroxy-3-indoleacetic acid (5-HIAA-^{14}C) levels; the 5-HT-^{14}C tissue spaces approximated that of the extracellular space. Both iodoacetic acid and 0°C apparently block the inward transport of 5-HT-^{14}C at the cell membrane. Procaine and nicotine increased both 5-HT-^{14}C uptake and intracellular pH, whereas only procaine decreased the 5-HIAA-^{14}C space and, also, inhibited 5-HIAA-^{14}C formation in guinea pig brain mitochondria. Nicotine may alter 5-HT-^{14}C distribution or binding by increasing intracellular pH. In addition to this action, procaine could block 5-HT-^{14}C metabolism by inhibiting monoamine oxidase, by preventing access of 5-HT-^{14}C to monoamine oxidase at the mitochondrial membrane, or by some combination of these two actions. (Auth. Abs.)

71-0226. Welch, R. M., Loh, A., Conney, A. H. **Cigarette Smoke: Stimulatory Effect on Metabolism of 3,4-Benzpyrene by Enzymes in Rat Lung.** *Life Sciences* 10(4, Pt. 1):215-221, February 15, 1971.

The enzymatic hydroxylation of 3,4-benzopyrene (BP) by lung was increased 34 percent and 18 percent in rats exposed to cigarette smoke for 2 or 4 hours, respectively. Induction of BP-hydroxylase in lung by cigarette smoke was completely blocked by actinomycin D or puromycin. An increase in BP-hydroxylase activity was also observed in various organs of pregnant rats exposed to cigarette smoke 5 hours daily for 3 days. The most marked increases were observed in the lung (12-fold) and placenta (4-fold), although increases were also observed in the intestine and in maternal and fetal liver. (Auth. Abs.)

71-0227. Wenzel, D. G., Wheatley, J. W., Byrd, G. D. **Effects of Nicotine on Cultured Rat Heart Cells.** *Toxicology and Applied Pharmacology* 17(3):774-785, November 1970.

Cells from hearts of 2- to 4-day-old rats were separated into cultures of 93 percent endothelioid (E) cells, and 95 percent muscle (M) cells, on the basis of the rapid-attachment of E-cells to culture dishes. Cells beat longer in cultures composed chiefly of M-cells than in unseparated cultures. Incorporation of nicotine alkaloid (0.003–0.6 mM) in the medium of M-cell cultures produced a further increase in the duration of beating and slowed the time-related decline in beating rate. These actions of nicotine were not attributable to effects on cell attachment or to stimulation of cells which had stopped beating. Differences between the two types of cells, in response to higher concentrations of nicotine (1.5 mM and 6.0 mM), were demonstrated by vacuole formation and nuclear changes. Untreated cultures, initially either 93 percent E-cells or 95 percent M-cells, differed in glucose-6-phosphate dehydrogenase (G-6-PDH), lactic dehydrogenase (LDH) and its isoenzymes, pyruvic kinase (PK) and isocitric dehydrogenase linked to nicotinamide adenine dinucleotide phosphate (ICDH-NADP) activities over an 18-day period. With the exception of a decreased fall in the LDH-H subunit activity in both cell types, treatment with nicotine (0.016 mM to 0.6 mM) did not alter any of the enzyme activities measured.

See also, **71-0241, 71-0243, 71-0267, 71-0268, 71-0271, 71-0294, 71-0306, 71-0313, 71-0316, 71-0331, 71-0352**

MORTALITY AND MORBIDITY

71-0228. Carnow, B. W. **Air Pollution and Physician Responsibility.** *Archives of Internal Medicine* 127(1):91-95, January 1971.

The relationship of air pollution to disease and other health problems is reviewed. The ubiquitous effects of air pollution as compared to cigarette smoking, its constituents, its lethal effects during high concentrations and its chronic effects during lower than lethal doses are discussed. The physiological effects of some of the more toxic air pollutants, including carbon monoxide, lead, pesticides and radioactive materials are briefly described. The role and responsibility of the physician in regard to air pollution and its control is outlined.

71-0229. Christine, B. W., Sullivan, P. D. **Effects of Cigarette Smoking on Connecticut Residents.** *Connecticut Health Bulletin* 85(1):23-28, January 1971.

Data for some of the conditions for which cigarette smoking has been implicated in a causal relationship is presented. In Connecticut, cancer of the respiratory system, the leading cancer in males, continues its upward incidence trend with the rate in females increasing at a greater percent than in males. Though mortality from heart disease in Connecticut residents has leveled somewhat in recent years, it is a disease which strikes in the early life and, unlike cancer, may lead to many unproductive years of disability preceding death. Chronic conditions such as emphysema and bronchitis may also begin early in life and account for many years of limited living before causing death or contributing to demise from infection. (Auth. Abs.)

71-0230. Enslein, K., Rose, C. L. **Computer Based Data Analysis in Longevity Research.** *Computers and Biomedical Research* 4:289-329, August 1970.

Multiple procedures of data analysis were applied to a body of data consisting of the life history information gathered from next of kin listed on death certificates of 500 white male deaths in Boston during 1965. Seventy variables were analyzed by zero-order correlation, multiple regression, linear discriminant analysis, factor analysis, nonlinear discriminant analysis and nonlinear clustering. In the univariate analysis of the 70 variables and their correlation with longevity, smoking variables showed high negative correlations. However, this correlation could be accounted for by the secular increase in smoking of cigarettes. It is shown that in a study such as this, in which all individuals die essentially at a single point in time, the effect of smoking on longevity cannot be measured since the probability of a given individual being a cigarette smoker is a very strong function of the birth year. A substantial shift was found in significance of independent variables as one proceeds from univariate to multivariate and from linear to nonlinear analysis. Various perturbations in such studies are outlined, such as the effects of secularity and bimodal distributions. The substantive findings suggest that physical predictors are more important than social predictors to account for advanced longevity while the contrary holds for moderate longevity. Although social variables are more valuable to secularity than physical variables (which whittle down their presence in the variable set and consequently their ability to emerge as important relative to physical variables), there was some evidence of their being more important than physical variables.

71-0231. Hedrick, J. L. **The Economic Costs of Cigarette Smoking.** *HSMHA Health Reports* 86(2):179-182, February 1971.

A report issued by the Canadian Department of National Health and Welfare which presents the estimated cost of certain consequences of cigarette smoking in Canada is reviewed and its applicability to the U.S. situation is assessed. The extrapolated health cost associated with smoking is $5.3 billion for the United States. This sum is greater by 20 percent than the $4.4 billion in total consumer expenditures, excluding taxes, for cigarettes in 1966. Much research is needed to provide a firm estimate of the direct and indirect economic costs of smoking for the U.S. Such research may show, for example, that an accurate estimate of health costs is perhaps 50 percent greater or lesser than the figure extrapolated from the Canadian study. However, the magnitude of such costs is significant and justifies concern over the allocation of national resources to nonproductive and even harmful uses. (Auth. Abs. Mod.)

71-0232. Lancet. **Counterblaste to Tobacco.** *Lancet* 1(7689):69-70, January 9, 1971.

The Royal College of Physicians of London's 1971 report on the effects of smoking on health is briefly reviewed. The report is praised for its dogmatic presentation of scientific and medical evidence which clearly indicates the health hazards of cigarette smoking, for its emphasis on the evident reduced risks of stopping smoking, and for its recommendations to restrict cigarette usage, sales and advertising. Some criticisms as to insubstantial data, unsupportable evidence and statistical juggling are also made.

71-0233. Reid, D. D., Fletcher, C. M. **International Studies in Chronic Respiratory Disease.** *British Medical Bulletin* 27(1):59-64, January 1971.

These international studies show that reported differences between countries in mortality from chronic lung disease cannot be lightly dismissed. Some confusion and disagreement about the basis for making diagnoses of emphysema or bronchitis still persist. But, generally speaking, population surveys of respiratory symptoms and function in several countries agree in the ranking of the burden of chronic lung disease between the rates of prevalence thus found and the death rate from chronic lung diseases as a whole. The effect of differences in national smoking habits, such as the Danish use of pipes and cigars and the British excessive use of cigarettes, emphasizes the benefit of a national taxation policy which favors the first rather than the second. The fact that current smoking habits cannot completely explain the high rates of chronic lung disease in British cities suggests that air pollution or some as yet unknown factor in the British urban environment accentuates the effect of smoking, especially among older men. That respiratory symptoms are less common in Japanese middle-aged cigarette smokers than in those in the U.S. or Europe points to the need for continuing studies of the rate of evolution of lung disease in a population being newly and rapidly exposed to the respiratory hazards of a dense industrial community adopting Western habits of life. Cigarette smoking, formerly less common among Japanese men than in the U.S. or Britain, is increasing rapidly and followup studies should show whether chronic lung disease among the Japanese will evolve towards the Western mode. The apparent change in the frequency and character of respiratory disease among migrants from Britain to the U.S. and South Africa demonstrates the importance of the social and climatic environment and the potential for improvement in Britain.

71-0234. Seltzer, C. C. **Cigarettes and Heart Disease. (Letter)** *New England Journal of Medicine* 284(10):557-558, March 11, 1971.

Percentage changes in adult per capita cigarette consumption are compared with death rates for arteriosclerotic heart disease in several countries during the 1965-1967 period. The data do not support the parallelism of secular changes in cigarette consumption and heart-disease mortality.

71-0235. Terry, L. L. **The Future of an Illusion.** *American Journal of Public Health and the Nation's Health* 61(2):233-240, February 1971.

The magnitude of the cigarette-induced problem in the U.S., some of the countermeasures that are showing increasing efficacy, and some of the measures being used abroad to regulate cigarette smoking are discussed.

71-0236. Weizenecker, R., Deal, W. B. **Tobacco Cropper's Sickness.** *Journal of the Florida Medical Association* 57(12):13-14, December 1970.

An illness occurring among harvesters of Type 14 tobacco is described. Though the illness is common among tobacco farmers in north central Florida, no previous reports have appeared in the medical literature. The noxious material is presumed to be in green tobacco gum and to be absorbed through the skin. Preliminary observations suggest individual susceptibility and that intoxication can be prevented by the use of waterproof gloves and clothing. (Auth. Abs.)

See also, **71-0237, 71-0245, 71-0246, 71-0249, 71-0257, 71-0265, 71-0290**

NEOPLASTIC DISEASES

71-0237. American Cancer Society. **1971 Cancer Facts and Figures.** *American Cancer Society, Inc.,* 1970, 31 pp.

Basic cancer data, including statistics on morbidity and mortality, site and sex incidence, and survivability are presented. The importance of early detection, trends in individual sites of cancer, ways for individual protection against cancer, public and professional cancer programs and public attitudes toward cancer are discussed. Specific information is provided on cancers of the breast, colon-rectum, lung, mouth area, skin and uterus, as well as leukemia. The recent ban on radio and television advertising of cigarettes, government subsidies to the tobacco industry and health-related tobacco research are mentioned. Recent research on the effects of cigarettes on the nonsmokers in a smoking environment, the induction of lung cancer in dogs with cigarette smoke, and the low birth weight of neonates from mothers who smoked during pregnancy is reviewed. Various activities of the American Cancer Society, including its antismoking program, support of the International Association of Laryngectomees, research sponsorship, and clinical investigation program are described along with some of the economic aspects of cancer.

71-0238. Anderson, D. L. **Cause and Prevention of Lip Cancer.** *Journal of the Canadian Dental Association* 37(4):138-142, April 1971.

This analysis of recent incidence rates shows that the major cause of lip cancer is accumulated irradiation by ultraviolet light from the sun in individuals deficient in melanin pigment. Sun-screening ointments provide the best protection and should be used by white males with outdoor occupations, especially in the Prairie and Atlantic provinces which have a high lip cancer incidence. Although many lip cancer patients smoke pipes, pipe smokers are a minority among lip cancer patients. Studies on the association of pipe smoking and lip cancer show stronger statistical correlations for residence, nativity, outdoor occupations and age than for tobacco, smoked or unsmoked. In addition, lip cancer is rare in Negro pipe smokers.

71-0239. Bulay, O. M., Wattenberg, L. W. **Carcinogenic Effects of Polycyclic Hydrocarbon Carcinogen Administration to Mice During Pregnancy on the Progeny.** *Journal of the National Cancer Institute* 46(2):397-402, February 1971.

Intraperitoneal injections of either benzo(*a*)pyrene (BP) or 7,12-dimethylbenz(*a*)anthracene (DMBA) into mice during the last half of pregnancy resulted in an increased incidence of pulmonary adenomas and skin papillomas in progeny that were delivered surgically and nursed on foster mothers. The progeny of DMBA-treated mothers also developed ovarian tumors that were not observed in progeny of controls or BP-treated mothers. (Auth. Abs.)

71-0240. Chyle, P., Chyle, M., Korb, J., Papanek, M. **Virus Tabakove Mozaiky, Polyfenoly a Kancerogenita Tabakoveho Navyku. [Tobacco Mosaic Virus, Polyphenols and the Carcinogenicity of the Tobacco Habit.]** *Ceskoslovenska Epidemiologie, Mikrobiologie, Imunologie* 20(1):32-42, January 1971, Czech.

It was found that tobacco mosaic virus was present in 84 out of 91 samples of tobacco products from 21 countries (snuff, cigarettes, cigars, and pipe tobacco). But it was not possible to prove any direct oncogenic activity of the virus in the animal cell although a cytopathic effect was observed *in vitro*. There is considerably less TMV in cigar and pipe tobaccos than in cigarettes. This is due to differences in the fermentation processes employed. TMV is transported via the smoke even into the lungs of nonsmokers who dwell in the vicinity of people indulging in the tobacco habit. Polyphenols play an important role in the plant organism, especially in connection with virus infections. The fermentation process is a very important factor influencing the final content of phenolics in the finished product. The introduction of the flue-curing method for Virginia type tobaccos runs parallel with the rising incidence of lung cancer among smokers. Phenolic compounds are typical of smoke from Virginia tobacco. These act synergistically with various viruses and most probably are the long sought for oncogenic factor of cigarette tobacco. (Auth. Abs.)

71-0241. DiPaolo, J. A., Nelson, R. L., Donovan, P. J. **Characteristics of Primary Tumors by Carcinogenic Polycyclic Hydrocarbons in Syrian Hamsters.** *Journal of the National Cancer Institute* 46(1):171-181, January 1971.

Six primary subcutaneous tumors induced with a single injection of benzo(*a*)pyrene or 7,12-dimethylbenz(*a*) anthracene were analyzed for histopathology, growth *in vitro*, transplantability, and karyology. All tumors were fibrosarcomas with varying degrees of differentiation. Tumor cultures were characterized by rapid growth and increase in acidity of medium followed by quick degeneration and survival of a few cells which produced a population that grew indefinitely *in vitro*. The initial populations were diploid, near diploid, or tetraploid and had some acentric pieces, chromatid rearrangements, and marker chromosomes but without any common karyotypic change. Subsequently, heteroploidy increased. Cells lacked orientation and occasionally piled up. Cloning without a feeder resulted in diverse colonies, some of which were randomly oriented with crisscrossing of filaments. Tumors derived from these cultures were transplantable into hamsters. These tumors were more anaplastic than primary tumors. Comparison of these studies with *in vitro* studies in which quantitative transformation was obtained with Syrian hamster embryo cells and polycyclic hydrocarbon carcinogens leads to the conclusion that *in vitro* investigations of transformation provide information relevant to *in vivo* transformation. (Auth. Abs.)

71-0242. Fischer, G. **Acerca de la Causalidad de los Tumores Vesicales (Bajo Especial Consideracion del Consumo de Cigarrillos). [The Causality of Bladder Tumors (As Related to Cigarette Consumption).]** *Folia Clinica Internacional* 20(12):784-790, December 1970, Spanish.

This statistical study demonstrates that heavy smoking over a number of years can influence, at least in men and in a manner as yet undefined, the development of bladder tumors. The data show that of the patients with tumors of the bladder, 55 percent were heavy smokers, 14 percent light smokers, 28 percent ex-smokers, and 3 percent nonsmokers. In contrast to this, the figures show that individuals affected with benign hypertrophy of the prostate were comprised of 24 percent nonsmokers, 42.5 percent ex-smokers, 17.5 percent light smokers, and 16 percent heavy smokers.

71-0243. Flesher, J. W. **The Possible Role of Reactive Metabolites of Polycyclic Hydrocarbons in Oncogenesis.** In: *Proceedings of the Tobacco and Health Conference,* Conference Report 2. Lexington, Kentucky, February 24-25, 1970. University of Kentucky, Tobacco and Health Research Institute, 1970, pp. 99-112.

Previous experiments have established that 7-hydroxy-dimethylbenz(*a*)anthracene is formed from dimethylbenz(*a*)anthracene (DMBA) by rat liver homogenates. Its formation represents a toxification reaction, as it is clearly more toxic than DMBA. The compound is also a potent carcinogen. Studies of its distribution showed that far less of the hydroxy derivative than DMBA reaches the mammary gland and other fatty tissue. This was in accordance with the finding of its lower carcinogenicity for mammary tissue. A hypothesis that the ultimate carcinogen is a highly reactive carbonium ion was tested. In conformity with this hypothesis it has been found that tumors are rapidly formed following repeated subcutaneous injection of compounds which would be expected to be precursors of carbonium ions. Each compound was administered in 1 mg doses (in sesame oil) by subcutaneous injection on alternate days for 20 doses. 7-Iodomethyl-12-methylbenz(*a*)anthracene, 7-bromomethyl-12-methylbenz(*a*)anthracene, 7-benzoyloxymethyl-12-methylbenz(*a*)anthracene were the most active and rapidly induced sarcomata at the site of injection. 7-Hydroxymethyl-12-methylbenz(*a*)anthracene, 7-formyl-12-methylbenz(*a*)anthracene, and 7-methoxymethyl-12-methylbenz(*a*)anthracene were less active; 4-hydroxy-7,12-DMBA and 4-methoxy-7,12-DMBA were inactive under these experimental conditions. Only DMBA and its 7-hydroxymethyl metabolite induced breast cancer in addition to subcutaneous sarcomata. The high degree of carcinogenicity of the most active compounds, considered together with their chemical structure, suggest that conversion to more reactive intermediates must occur *in vivo.* (Auth. Abs.)

71-0244. Gasinska, T., Gburek, Z. **O Szkodliwosci Przewleklego Palenia Tytoniu. [The Harmful Effects of Chronic Tobacco Smoking.]** *Wiadomosci Lekarskie* 23(24):2157-2162, December 15, 1970, Polish.

The authors reviewed 3466 case records to determine the frequency of certain diseases in relation to chronic tobacco smoking. It was found that weight deficiency and upper respiratory tract infections were statistically more significant in all smokers above 40 years, while pulmonary emphysema and cor pulmonale were significantly more frequent in women above 40 years, bronchial and pulmonary carcinoma was more frequent in men above 40 years, peptic ulcer was more frequent in all patients with the exception of women below 40 years, while in women in the same age group, arterial hypertension was more frequent. Neuroses were more frequent in all patients. (Auth. Abs.)

71-0245. Graham, S., Levin, M. L. **Smoking Withdrawal in the Reduction of Risk of Lung Cancer.** *Cancer* 27(4):865-871, April 1971.

A study of about 700 cancer patients and 2,000 control patients from Roswell Park Memorial Institute was made to examine variations in risk associated with different lengths of time since ex-smokers withdrew from tobacco. Of some significance to preventive medicine is the finding that increases in length of time since the individual has withdrawn from smoking are associated with decreases in his lung cancer risk. In our series, risk after not smoking cigarettes for 10 years approached that of persons who had never smoked. Risk declined for individuals who had smoked over exceedingly long periods of time (30-40 years) as well as for persons who had smoked for shorter periods. These findings also offer further evidence of epidemiologic significance: the dose-response relationship inherent in observations of increased risk with increased amount smoked applies to withdrawal, as well. (Auth. Abs.)

71-0246. Ivakhno, G. I. **Nekotoryye Voprosy Etiologicheskoy Obshchnosti Raka Gortani i Legkogo. [Some Problems of the Etiological Community of Cancer of the Larynx and Lungs.]** *Zhurnal Ushnykh, Nosovykh i Gorlovykh Boleznei* 27:30-32, May-June 1967.

Statistical investigations established non-uniformity of morbidity and mortality from cancer of the larynx and the lungs in various regions of the Ukraine. A pronounced correlation was found between the climatic and geographical features, and also between the quantity of consumed tobacco, and mortality due to cancer of the larynx and cancer of the lungs. (Auth. Abs. Mod.)

71-0247. Jussawalla, D. J. **The Epidemiology of Oral and Oropharyngeal Cancer in India.** *Proceedings of the International Congress on Otorhinolaryngology*, 9th Congress, 206:832-839, 1970.

Tobacco, especially when chewed, is an important contributory factor in the etiology of cancer of the buccal cavity and pharynx. This association is probably as close as that of smoking and lung cancer. Tobacco fumes inhaled during smoking create a stream which impinges directly on the tonsils, palate and base of the tongue, and are probably responsible for the relatively higher frequency of cancer at these sites in the buccal cavity in smokers. Unlike the cigarette, the Indian 'bidi' contains very little tobacco dust and is unlikely to create enough smoke to reach the bronchi when inhaled. It thus causes its carcinogenic effect higher up the respiratory tract on the palate, tonsils and base of the tongue. Other etiological causes exist, however, such as sharp teeth, which appear to cause cancer in the anterior two-thirds of the tongue, along the lateral borders. Submucous fibrosis is probably caused by an allergic reaction to a spicy diet acting as a low-grade chemical irritant on tissues debilitated by malnutrition from an inadequate diet and avitaminosis. Auto-immune response as a causative factor has not yet been adequately investigated.

71-0248. Kempski, H. W. **Nuevos Aspectos Endocrinos en el Cancer Pulmonar. [New Endocrinous Aspects in Pulmonary Cancer.]** *Folia Clinica Internacional* 18(7/8):436-438, July-August 1968, Spanish.

Observations of 22,450 patients have furnished the basis for this endocrinological view of smoking habits. In view of the decisive influence of the endocrinium in many cancers, it is essential to try to equilibrate the sexual life in the most physiological manner (attention to coitus interruptus), especially at the critical age, when the reduction in sex hormone production results in a well-known greater incidence of malignant growths. The abuse of smoking and its consequences in lung carcinogenesis may be prevented by a comprehension of sexual problems in both sexes. The fertile and infertile days of women should be noted, especially for the biological regulation of conception. The use of oral contraceptives may complicate the endocrine state, so closely related to the nervous system. Often, it may be the reason for more pronounced and earlier sexual decline with its consequences, especially in women, conducive to known psychic alterations which can then lead to heavier smoking. By balancing temporary abstinence in sexual life with more work and paying attention to the fertile and infertile periods in women, many malignant growths may be prevented by healthy living without excesses (eating, drinking, smoking, etc.). Human understanding and consideration of the neuroendocrinologic factor are necessary in order to avoid the consequences of tobacco abuse, especially in relation to lung cancer. (Auth. Abs. Mod.)

71-0249. Krain, L. S. **The Rising Incidence of Carcinoma of the Pancreas.** *American Journal of Gastroenterology* 54(5):500-507, November 1970.

Genetic (hormonal), and environmental factors were evaluated in terms of an association with pancreatic cancer mortality, which has increased nearly three-fold in the last 40 years. Genetic (hormonal) factors were discarded and environmental factors such as cigarette smoking and industrial exposure were emphasized in terms of an association with pancreatic cancer. Evidence was cited from national origin and racial comparisons as supportive of environmental association. An air pollution linkage with pancreatic cancer, at least based on comparative California city air pollution levels was dismissed, due to a nonsignificant ($p > .10$) association. A broader epidemiologic study focusing on cigarette-smoke and industrial chemical exposure constituents is suggested. (Auth. Abs.)

71-0250. Krasnyanskaya, P. N. **Eksperimental n'yye Issledovaniya o Roli Kureniya v Proiskhozhdenii Raka Legkogo. [Experimental Investigation on the Role of Smoking in the Development of Lung Cancer.]** *Voprosy Onkologii* 17(1):59-62, 1971, Russian.

In two series of experiments on 95 rabbits, changes in the respiratory tract (nasal cavity, trachea and lungs) were studied under continuous smoking conditions using cigarettes containing Georgian tobacco, using a method similar to natural smoking of man. In the first series, where the animals were exposed only to smoking, pre-tumorous changes developed in the third to fourth year of the experiment. In the second series, where the animals were exposed to the combined effect of smoking and a single 15 to 20 mg intratracheal injection of benzo(*a*)pyrene, pretumorous changes developed in the first year to a year and a half. Smoking was considered to be an insignificant carcinogenic factor for pulmonary tissue. (Auth. Abs. Mod.)

71-0251. Krivinka, R., Kubik, A. **Koureni Cigaret a Riziko Vzniku Plicni Rakoviny. [Cigarette Smoking and the Hazard of Lung Cancer.]** *Ceskoslovenska Zdravotnictvi* 19(2):57-61, 1971, Czech.

A group of 12,322 men aged 40–64 years with a normal radiophotogram (mass X-ray examination of the population of the Kolin district in 1966) according to a brief questionnaire completed simultaneously with the radiophotographic examination included 51 percent cigarette smokers, 12 percent former cigarette smokers, 2 percent smokers or former smokers of cigars or pipes and 35 percent nonsmokers. During the subsequent 3 1/2 years in the above group, 61 cases of lung cancer confirmed by histological or cytological examination were detected; of these, 44 were in the group of 2707 smokers who smoked more than 200,000 cigarettes, 11 in the group of 3635 smokers who smoked less than 200,000 cigarettes, 5 in the group of 1487 former cigarette smokers, and one in the group of 4271 nonsmokers. The assessment of a brief smoking history by means of a questionnaire during mass radiography is a useful screening method for the detection of groups with a high hazard of lung cancer in men aged 40–64 years with a normal X-ray finding of the lungs. (Auth. Abs. Mod.)

71-0252. Kubik, A., Krivinka, R., Stasek, V., Svandova, E., Krivanek, J., Neumann, V. **Screening for Lung Cancer High-Risk Groups.** *Scandinavian Journal of Respiratory Diseases* 51(4):290-300, 1970.

The role of serial radiography in early detection of lung cancer, particularly slow-growing cases, continues to be an open problem from both medical and economic aspects. The cost of finding a potential survivor can be reduced if groups at great risk are investigated. In a prospective study of 12,322 males, aged 40–64 years, with a normal chest film on entry, a brief standard interview done at the occasion of a mass X-ray survey was confirmed to be a useful screening method for identification of lung cancer high-risk groups. An association between the following characteristics recorded at interview and the occurrence of proved lung cancer during the subsequent 3 1/2 years was found: heavy cigarette-smoking, chronic cough, deterioration of cough, expectoration of sputum and blood spitting in the past year. The predictive value of cough and expectoration has been maintained 2–3 years after the interview had been held. (Auth. Abs.)

71-0253. Lee, P. N., Peto, R. **The Effect of the Age of Mice on the Incidence of Skin Cancer.** *British Journal of Cancer* 24(4):849-852, December 1970.

The plausibilities of two hypotheses explaining the increased cancer incidence rate in old age caused by a constant dose of carcinogen (tobacco smoke condensate) were compared using a mouse skin painting experiment in which two groups of mice started treatment at different ages. It was shown that the hypothesis of the increased rate being caused simply by increased vulnerability of old animals was not as plausible as the alternative hypothesis of the carcinogen acting to some extent cumulatively (Auth. Abs.)

71-0254. Malhotra, S. L. **Clues to the Possible Mode of Action of Cigarette Smoke in the Pathogenesis of Lung Cancer.** *Journal of the Indian Medical Association* 55(8):265-270, October 16, 1970.

See Abstract 70-0108.

71-0255. Nelson, J. F., Ship, I. I. **Intraoral Carcinoma: Predisposing Factors and Their Frequency of Incidence as Related to Age at Onset.** *Journal of the American Dental Association* 82(3):564-568, March 1971.

Results of a study of 191 patients with primary intraoral carcinoma during a ten-year period are reported. The age of the patient at the time cancer was diagnosed was used as the basis for comparing the frequency of predisposing factors that may bear a relationship to intraoral malignancy. The variables studied were heavy alcoholic intake, heavy smoking, syphilis, hepatic cirrhosis, chronic anemia, diabetes mellitus, tuberculosis and oral trauma. The data presented provide evidence that the frequency of these predisposing variables is negatively associated with age at the time of diagnosis, for example, that persons with a higher frequency of predisposing factors develop malignancy at an earlier age, and that the relationship is consistent regardless of sex and racial groupings. (Auth. Abs. Mod.)

71-0256. Ochsner, A. **Bronchogenic Carcinoma, a Largely Preventable Lesion Assuming Epidemic Proportions. (Editorial)** *Chest* 59(4):358-359, April 1971.

Studies showing the direct relationship between the increased incidence of bronchogenic carcinoma since the mid-1930's and rising cigarette consumption are reviewed. Most primary lung cancers are preventable since they are caused by smoking, and physicians should admonish all patients to refrain from or quit smoking.

71-0257. Rickard, V. D., Sampson, C. C. **Incidence of Bronchogenic Carcinoma in Negroes. Statistical Analysis of 94 Cases.** *Journal of the National Medical Association* 63(1):10-12, January 1971.

An analysis of bronchogenic carcinoma of 94 Negro patients is presented. The incidence and relationship of smoking to bronchogenic carcinoma in Negroes appears to be the same as in other racial groups. (Auth. Abs.)

71-0258. Roe, F.J.C., Peto, R., Kearns, F., Bishop, D. **The Mechanism of Carcinogenesis by the Neutral Fraction of Cigarette Smoke Condensate.** *British Journal of Cancer* 24(4):788-806, December 1970.

Sixteen groups, each of 50 Swiss female SPF mice, were treated thrice weekly with various combinations of 3,4-benzopyrene (BP) and/or the neutral fraction of cigarette smoke (NF) in acetone applied to the skin. Some groups received one carcinogen, some the other and some a mixture of the two. Skin tumor incidence rates were found to increase both with the dose of NF and with the dose of BP. With BP alone a threshold dose was found beyond which a very heavy incidence rate of malignant skin tumors occurred. After correction of the results for intercurrent deaths, it was found that when NF and BP are applied together as a mixture they do not act independently in the production of malignant skin tumors but interact positively. This suggests that some of the components of NF act as cocarcinogens rather than as complete carcinogens. Treatment with NF appeared to increase the incidence of malignant lymphomas. The data were not suitable for deciding whether the various treatments influenced the rates of incidence of internal tumors of other types, for example, lung tumors. (Auth. Abs.)

71-0259. Saccomanno, G., Archer, V. E., Auerbach, O., Kuschner, M., Saunders, R. P., Klein, M. G. **Histologic Types of Lung Cancer Among Uranium Miners.** *Cancer* 27(3):515-523, March 1971.

A panel of pathologists classified 121 cases of lung cancer from American uranium miners by cell type, and 138 cases of cancer in non-miners. Undifferentiated carcinomas showed a higher incidence with increasing radiation exposure and age and cigarette matched controls. At high radiation exposures, the WHO 2B cell type accounted for more than half the total. An average of 15.9 years elapsed from the beginning of mining to development of cancer. It was longest among the highly exposed men and was shortest among men with small cell, undifferentiated carcinoma who had less than 700 Work Level Months exposure. In all age and cigarette groups, radiation exposure increased the small cell, undifferentiated, but decreased the epidermoid tumors. Age showed an increase, in epidermoid carcinoma. Undifferentiated small cell types were slightly increased among the lowest exposure groups. Cigarette smoking in uranium miners appeared to be a potent carcinogen with respect to lung cancer, but exerted little, if any, influence on the cell type of lung cancer. (Auth. Abs. Mod.)

71-0260. Wal, A.M.V.D., Lende, R. van der. **Cara, Rookgewoonten en Bronchus Carcinoom. [Chronic Non-Specific Lung Disease, Smoking and Lung Cancer.]** *Jaarboek Kankeronderzoek en Kankerbestrijding* 19:87-96, 1969, Dutch.

The correlation between lung cancer, cigarette smoking and CNSLD (chronic non-specific lung disease) was studied in 150 lung cancer patients, 150 control-patients matched for sex, age and home environment and in 100 control persons matched in addition for cigarette smoking. The carcinomas were largely (101 times) of the squamous cell type. CNSLD was found in 96 percent of the lung cancer cases and in 34 percent and 28 percent of the control-groups. On the bronchograms of the lung cancer patients, CNSLD characteristics were frequently (75 percent) found outside the tumor area both in the light and the heavy cigarette smokers. In an epidemiologic study of chronic non-specific lung disease in the Netherlands, exogenous factors as expected had a definite influence on symptoms of cough and phlegm, but endogenous factors seemed largely responsible for dyspnea and bronchial obstruction. It seems advisable that young CNSLD-patients do not start cigarette smoking as they are probably predisposed for lung cancer. (Auth. Abs.)

71-0261. Werf-Messing, B. van der, Kaalen, J.G.A.H. **Beroepen en Rookgewoonten van Rotterdamse Blaascarcinoom-patienten. [Occupations and Smoking Habits of Bladder Carcinoma Patients in Rotterdam.]** *Jaarboek Kankeronderzoek en Kankerbestrijding* 19:77-85, 1969, Dutch.

The relationship of occupational exposure and smoking habits of 346 male bladder carcinoma patients treated in a Rotterdam hospital between 1960 and 1964 was investigated statistically. The number of light smokers in cancer patients and controls increased significantly with age, the number of heavy smokers decreased proportionately, and the percentage of average smokers remained constant. The smoking habits of cancer and control patients in each age group were almost identical. No demonstrable connection was found between the cigarette smoking habits and the clinical manifestation of bladder carcinomas. The average duration of exposure to hazardous conditions was significantly longer in the cancer patients than in the controls.

See also, **71-0203, 71-0285, 71-0310**

NON-NEOPLASTIC RESPIRATORY DISEASES

71-0262. Alanko, K. **Prevalence of Asthma in a Finnish Rural Population. A Study of Symptomatic Subjects Tested for Bronchial Hyperreactivity.** *Scandinavian Journal of Respiratory Diseases* (Supplement 79):1-64, 1970.

This study was aimed at developing a method for estimating asthma prevalence by demonstrating, in standard tests, abnormally increased bronchial reactivity in subjects whose symptoms conformed to the clinical picture. The study was made in two stages on the 10 to 59-year old population of Harjavalta rural commune (Satakunta, Finland). The first stage consisted of a survey of 2562 males and 2725 females to determine such symptoms as wheezing, persistent cough and breathlessness at rest, and whether asthma or hay fever had been diagnosed by a doctor. Symptoms were found in 667 subjects. Males had more symptoms than females in all age groups, and in both sexes symptoms increased with age. Asthma had been diagnosed in 1.2 percent of males and 1.6 percent of females, while hay fever and other allergic rhinitis occurred in 4.2 percent of males and 5.6 percent of females. Smokers and ex-smokers accounted for 50 to 80 percent of men 15 years and older. Less than 30 percent of all women smoked. A follow-up study of 284 symptomatic subjects and 104 controls revealed abnormally increased bronchial reactivity in 78 subjects (53 of a high degree and 25 of a mild degree). Marked hyperreactivity increased with age, but not in those with mild hyperreactivity. The population had an asthma prevalence of 1.21 percent, women having a slightly higher, but insignificant, prevalence than men. First-degree relatives of asthmatics had significantly more asthma than the controls. Asthmatics had significantly more bronchial obstruction than either controls or nonreactive bronchitic subjects. Asthmatics smoked as much as controls, but less than the bronchitics. Smoking was not considered to be an etiologic factor, although tobacco and cigarette smoking may provoke an asthmatic attack in some patients.

71-0263. Barach, A. L. **Pulmonary Emphysema: Pathogenesis and the Illusion of Increased Incidence.** *Medical Counterpoint* 3(2):40-43, February 1971.

Arguments against the overpublicized view that there is an increase in the incidence and mortality of pulmonary emphysema are presented. The pathogenesis of the disease is analyzed as related to and affected by cigarette smoking, inhalation of tobacco smoke, cigarette-produced cough, and cessation of smoking. Cigarette smoking is a frequent cause of chronic bronchitis but more studies are needed to prove conclusively that the bronchitic type of pulmonary emphysema is in fact caused by tobacco smoke.

71-0264. Brille, D. **Possibilities du Depistage au Stade Initial de al Bronchite Chronique et de l'Emphyseme Pulmonaire. [Possibilities of Detecting Early Stages of**

Chronic Bronchitis and Pulmonary Emphysema.] *Revue de Medecine* 11(37):2201-2210, October 29, 1970, French.

Detection of chronic obstructive bronchopulmonary diseases in the initial stages is possible, as epidemiological studies have proved. Systematic detection should now be developed with the aim of applying individual therapeutic measures as soon as this initial stage appears. A few suggestions and propositions have been put forward. They rely on various types of medical consultations and especially industrial medicine, public health clinics and the family doctor. Investigations which aim at detection should include mainly a systematic case history to discover whether there exists a chronic cough or expectoration and to specify the quantity of tobacco consumed, and the recording of a spirogram of forced expiration. Several tables in the report show the incidence of cough and expectoration in smokers and nonsmokers and the consumption of cigarettes by male and female smokers (three age groups). It was speculated that the influence of age could be attributed in part to a longer exposure to tobacco smoke. (Auth. Abs. Mod.)

71-0265. Christie, D. **Australian Bronchitis Mortality.** *Medical Journal of Australia* 1(1):21-25, January 2, 1971.

Over recent years extraordinary progress has been made in the management of chronic lung disease, based upon rational use of drug therapy and understanding of the disordered physiology. Nevertheless death rates from chronic bronchitis have increased substantially among men, and the beginnings of the same disturbing rise are apparent among women. It appears unlikely that air pollution is responsible in Australia, the evidence pointing to increased cigarette smoking as the major causative factor. (Auth. Abs.)

71-0266. Colley, J.R.T. **Respiratory Disease in Childhood.** *British Medical Bulletin* 27(1):9-14, January 1971.

Data are reviewed from surveys of respiratory morbidity and mortality that seek to assess the role of such external factors as social and domestic conditions, air pollution and smoking in the aggravation of chest disease in children and the possible long-term effect of such illnesses on the evolution of chronic lung disease in later life.

71-0267. Corn, M. **Dose to the Respiratory Tract From Personal, Occupational and Community Air Pollutants.** *Environmental Letters* 1(1):29-39, January 1971.

The doses (concentration x time) to the respiratory tract by urban, occupational and personal (smoking) pollutants were calculated by assuming pollutant concentration in air equivalent to air quality standards, threshold limit values and reported cigarette smoke concentrations, respectively. The calculations suggest that the most severe challenge by a large margin, is that posed to the pack a day cigarette smoker. Assumptions and results of calculations are presented. (Auth. Abs.)

71-0268. Dalhamn, T., Rosengren, A., Rylander, R. **Nasal Absorption of Organic Matter in Animal Experiments. I. Experimental Technique and Tobacco Smoke Absorption.** *Archives of Environmental Health* 22(5):554-556, May 1971.

Most of the long-term tobacco smoke exposure experiments have been performed with animals inhaling through their nares. It seems important to know to what extent the tobacco smoke is resorbed in the nasal cavities. The experimental equipment consists of two gas analyzers and two recorders, one of each serving the gas stream which has passed through the nose of a living animal, and the reference gas stream, respectively. The results suggest that a significant amount of smoke is absorbed. The mean value from eight animals of organic matter absorbed was 32 percent. (Auth. Abs.)

71-0269. Daly, W. J. **Single-Breath Gas Distribution in Chronic Obstructive Lung Disease. Isoproterenol Effect on Neon Dilution Volume and Diffusing Capacity.** *Archives of Internal Medicine* 127(4):763-766, April 1971.

Forty-nine patients with increased airway resistance (AR) and ten normal nonsmoking men were studied before and after isoproterenol hydrochloride inhalation. They were subdivided on the basis of chest roentgenogram, sputum production, and history into asthma, chronic bronchitis, and emphysema groups. The study reconfirmed the observation that normal nonsmoking males have virtually complete equilibration of a neon test gas during a single ten-second breath hold. Isoproterenol hydrochloride increased neon dilution volume (V_A) but not diffusing capacity (S_L), which was much less in the emphysema, highest in the asthma, and intermediate in the chronic bronchitis group. Neon dilution volume/plethysmographic lung volume (TLC) and D_L/V_A were similarly affected, except that V_A/TLC was not increased after isoproterenol administration in the emphysema group. These results confirm the anatomic observation that the capillary bed is not abnormal in emphysema and suggest that AR, which determines pulmonary gas distribution, is less responsive to bronchodilators in emphysema. They also suggest that dilution volume added by bronchodilators may have less than usual blood-gas contact. (Auth. Abs. Mod.)

71-0270. El-Sewefy, A. Z., Awad, S., Metwally, M. **Spirometric Measurements in an Egyptian Portland Cement Factory.** *Journal of the Egyptian Medical Association* 53(2):179-186, 1970.

Two hundred and twenty-three workers in dusty jobs and 90 workers in clean jobs at an Egyptian cement factory were examined for cement bronchitis using spirometric measurements. There was a significant difference between workers in the clean and dusty jobs due to the chemical irritation of the hydrated cement products on the bronchial tree, namely calcium hydroxide, hydrated dicalcium and tricalcium silicate. The effect of smoking on pulmonary physiology was inferior to the cement hazard. (Auth. Abs. Mod.)

71-0271. Fisher, A. B., Hyde, R. W., Baue, A. E., Reif, J. S., Kelly, D. F. **Effect of Carbon Monoxide on Function**

and Structure of the Lung. *Journal of Applied Physiology* 26(1):4-12, January 1969.

Four human subjects who inhaled 6 percent carbon monoxide for 18 sec had no significant change in lung volumes, mechanical properties, or diffusing capacity. Further investigations of possible histotoxic effects of carbon monoxide were performed in seven anesthetized dogs. After insertion of a tracheal divider and occlusion of the left pulmonary artery with a balloon catheter, the left lung was ventilated for 14-20 min with a gas containing 8-14 percent carbon monoxide while the right lung breathed air or oxygen. Femoral artery blood carboxyhemoglobin saturation did not rise higher than 18 percent. Measurements of diffusing capacity and pressure-volume curves of both lungs over the next 1/2-49 hr and examination of the lungs by light- and electron microscopy failed to reveal changes which could be attributed to carbon monoxide inhalation. Another dog that developed a carboxyhemoglobin saturation of 61 percent had congested, edematous, and hemorrhagic lungs. Therefore, the lung damage seen with carbon monoxide poisoning is probably related to impaired oxygen transport by the blood and is not a result of histotoxicity of the alveolar carbon monoxide. (Auth. Abs.)

71-0272. Goldsmith, J. R., Fallat, R. J. **Prospects for the Prevention of Disabling Pulmonary Disease.** *Milbank Memorial Fund Quarterly* 47(3, Part 2):235-249, July 1969.

Information concerning the natural history and epidemiology of chronic pulmonary disease is presented and four preventive strategies are proposed. People born with an alpha_1 antitrypsin deficiency should be counselled not to smoke, not to be employed in an occupation with an irritating or dusty pollutant exposure and not be exposed to domestic or urban pollution. Prophylactic and early treatment of pulmonary infections should be emphasized and genetic counselling may be of some value. Smokers with cough and sputum should be counselled to diminish exposure to smoking. The measurement of carbon monoxide exposure by such methods as the breath-holding expired air analysis can permit specific counselling. The treatment of hyaline membrane disease, pertussis, asthma and bronchitis is an effective mode of prevention. The control of emissions is an important strategy for community air pollution, for cooking and heating and other fumes in the home, and for occupational exposure. Such controls are of greatest importance to smokers, to those with other types of risky exposures and to those with inherited defects that make them unusually susceptible. Evidence of interaction of exposure to smoking and air pollution is sufficient that the prevention of a second exposure should be advised.

71-0273. Gregory, J. **A Study of 340 Cases of Chronic Bronchitis.** *Archives of Environmental Health* 22(4):428-439, April 1971.

At a Sheffield (England) steelworks 340 cases of frank disabling bronchitis were found between 1955 and 1961. The prevalence rate was 64 per 1,000 and the men lost 7.2 man-years in sickness-absence because of this disease per 1,000 man-years worked. Forty-seven cases started before the age of 15 years, and of the remainder 106 had an acute onset due to respiratory infection or gassing, commonly following acute bronchitis if they were over 40. Sixty-three percent of the cases started after this age, when the interval between onset and disability rapidly decreased as the onset was later. Smoking appeared to be more concerned with an insidious than an acute onset and aggravated the established disease. No evidence was found of the influence of dusty work on the disease, though work out of doors may have such an influence. (Auth. Abs.)

71-0274. Howard, P. **A Long-term Follow-up of Respiratory Symptoms and Ventilatory Function in a Group of Working Men.** *British Journal of Industrial Medicine* 27(4):326-333, October 1970.

Out of a group of 289 industrial workers, 159 have been studied for a period of 11 years beginning in 1956. The mean rate of fall of forced expiratory volume $(\text{FEV})_{0:75}$ was 0.034 liter/year and the rate of fall of forced vital capacity (FVC) was 0.064 liter/year. There was little change in the FEV percent FVC over the period. Sudden drops of FEV were observed in a few men. Between 1956 and 1962 the number of men with regular sputum expectoration increased, but after 1962 more men lost this symptom than acquired it. The FEV was often markedly reduced by the time regular symptoms of bronchitis appeared. It seemed likely that symptomatic evidence of bronchial inflammation and infection and smoking were not related to the loss of ventilatory capacity in most men. Factors considered important to the genesis of airways obstruction, such as smoking, bronchial inflammation, atmospheric pollution and occupation, may differ in their importance in different environments. In this study atmospheric pollution was probably the most important factor. (Auth. Abs.)

71-0275. Hutchison, D.C.S., Cook, P.J.L., Barter, C. E., Harris, H., Hugh-Jones, P. **Pulmonary Emphysema and Alpha_1-Antitrypsin Deficiency.** *British Medical Journal* 1(5751):689-694, March 27, 1971.

Of 72 patients with radiological evidence of pulmonary emphysema, emphysema occurred either alone or in association with bronchitis in 61, and 8 of these (13 percent) were found to have alpha_1-antitrypsin deficiency. The main features of this condition are: exertional dyspnea of relatively early onset (generally between 30 and 45 years of age), severely impaired FEV_1 and $\text{T}_\text{L}\text{CO}$, and radiological emphysema predominantly affecting the lower zones of the lungs. It is probable that any patient with all the above abnormalities has alpha_1-antitrypsin deficiency. There is evidence to suggest that cigarette smoking may hasten the onset of this type of emphysema. (Auth. Abs.)

71-0276. Laval, P. P. **Colloques sur la Bronchite Chronique. II. Prophylaxie et Traitement des Bronchites Chroniques. [Discussions on Chronic Bronchitis. II. Prophylaxis and Treatment of Chronic Bronchitis.]** *Revue de Tuberculose et de Pneumologie* 34(5):765-811, July-August 1970, French.

Data concerning the causative factors and treatment of chronic bronchitis are presented in numerous tables in this round table discussion. The importance of tobacco in the etiology of the disease is emphasized.

71-0277. Marwaha, R., Pande, R. S. **Lung Function in Indian Smokers. (Letter)** *New England Journal of Medicine* 284(7):394, February 18, 1971.

In a study of ventilatory capacities of 66 nonsmokers and 38 smokers in the 16-25 age range, significant differences were found between smokers and nonsmokers regarding maximum breathing capacity, timed vital capacity and residual volume. Smoking is believed to result in airway obstruction and air trapping or hyperinflation.

71-0278. Mueller, R. E., Keble, D. L., Plummer, J., Walker, S. H. **The Prevalence of Chronic Bronchitis, Chronic Airway Obstruction, and Respiratory Symptoms in a Colorado City.** *American Review of Respiratory Disease* 103(2):209-227, February 1971.

A study of the prevalence of chronic respiratory disease symptoms in a random sample comprising one fifth of the adult population of Glenwood Springs, Colorado was conducted in the spring of 1967. Standard methods were used that permitted comparison of results with certain other studies. The high prevalence of chronic bronchitis was found to be strongly related to smoking, particularly of cigarettes, and was independent of age, sex, or history of dust exposure at work. Chronic airway obstruction was found to be predominantly a disease of elderly male smokers and increased in frequency with increasing age after 49 years. Male smokers with a history of dust exposure at work had a higher rate of chronic airway obstruction than smokers without such a history. The prevalence of nonobstructive chronic bronchitis did not change significantly with age in men whereas that of combined chronic bronchitis and chronic airway obstruction increased. Chronic airway obstruction without bronchitis increased with age in men older than 49. It was uncommon in women, regardless of smoking habits. Exertional dyspnea was related to heart disease, increasing age, female sex, and smoking, but it correlated most strongly with spirometric evidence of airway obstruction. Wheezing was more common in male and female cigarette smokers, and hemoptysis was more common in male cigarette smokers than in nonsmokers. In all studies with which comparison was made, chronic bronchitis was strongly associated with smoking, but significant interstudy variation in prevalence was found both among smokers and nonsmokers, so that other factors might be of importance. More limited comparisons of the prevalence of chronic airway obstruction showed a consistent relationship of this condition to smoking in men but not in women. (Auth. Abs.)

71-0279. Rasmussen, D. L., Nelson, C. W. **Respiratory Function in Southern Appalachian Coal Miners.** *American Review of Respiratory Disease* 103(2):240-248, February 1971.

The results of pulmonary function studies of 368 soft-coal miners from the southern Appalachian coal fields showed no correlation between roentgenographic categories of pneumoconiosis and the results of ventilatory function tests. Impaired oxygen transfer was somewhat greater in subjects with advanced pneumoconiosis (progressive massive fibrosis), although equally severe impairment was found among many miners with simple pneumoconiosis or less definite roentgenographic abnormalities. Although cigarette smoking might contribute to both ventilatory insufficiency and impairment of oxygen transfer among soft-coal miners, severe pulmonary insufficiency is not unusual among nonsmoking miners. Disabling respiratory insufficiency occurred in the absence of roentgenographic evidence of progressive massive fibrosis and in the absence of significant ventilatory insufficiency. Impairment of oxygen transfer was commonly associated with disabling symptoms regardless of roentgenographic findings or ventilatory function. (Auth. Abs.)

71-0280. Reichel, G., Ulmer, W. T., Gary, K., Leuschner, A., Roske, G. **Einfluss des ortlich unterschiedlichen Verschmutzungsgrades im Stadtgebiet von Duisburg auf die Haufigkeit unspezifischer Atemwegserkrankungen. V. Mitteilung. [Influence of the Locally Different Grade of Pollution in the Township of Duisburg on the Incidence of Non-Specific Respiratory Diseases. V. Communication.]** *Internationales Archiv fur Arbeitsmedizin* 27(1/2):110-129, October 30, 1970, German.

A total of 1292 men and 843 women having their residences for more than 10 years in the town district of Duisburg were examined during the February 1965 to June 1966 period. According to the amount of total dust and of SO_4 precipitate, the residential districts may be divided into three different zones of dust nuisance. Comparison of the partial groups, being similar in their sociologic structures, their smoking habits and their age compositions, does not show any prevalence of cough, expectoration and dyspnea in dependence of the SO_4 or total dust precipitate. The same is true of the auscultation findings and diverse lung function parameters like intrabronchial flow resistance, arterial blood gases and arterio-alveolar carbon dioxide pressure difference. Division of the urban pollution zones according to their SO_2 and dust precipitate remains nevertheless a problem, because the concentration of other noxious substances does not go hand in hand with the amount of dust precipitate and SO_2 emission as can be shown, for example, in case of the fluorine content of leaves. Information, in how far industrial air pollution altogether has a noxious effect on the bronchial system, is, however, to be gained from the comparison between a rural population not exposed to industrial waste gases and the town population of the Ruhr-district. This comparison did not show any differences between town and country population which would let assume an orientated influence of unspecified airway diseases by air pollution in the Ruhr-district. (Auth. Abs. Mod.)

71-0281. Rivero-Serrano, O., Ponce de Leon, H. M. **Enfermedad Pulmonar Obstructiva Cronica. [Chronic Obstructive Pulmonary Disease.]** *Gaceta Medica de Mexico* 100(9):889-917, September 1970, Spanish.

A comprehensive study of the medical advances, limitations, and the similarities and differences concerning chronic obstructive broncho-pulmonary diseases -- chronic bronchitis, emphysema, and bronchial asthma -- is presented. The subject is reviewed with relation to incidence, residence, and etiological factors which are known to affect the diseases, such as air pollution, smoking, occupations, and infections. The pathology and symptoms of the diseases and their respiratory and cardiovascular repercussions are discussed, along with an analysis of what preventive measures, medical treatment, physical therapy and rehabilitation, and surgery are applicable to them.

71-0282. Sluis-Cremer, G. K. **Allergic Diathesis in Relation to Chronic Bronchitis.** *South African Medical Journal* 44(47):1324-1329, November 21, 1970.

An investigation was undertaken into the incidence of a personal or family history of certain allergic conditions in a random sample of males over the age of 35 years – miners and nonminers – in a Witwatersrand mining town. The incidence of chronic bronchitis, wheezing, change of chest symptoms with weather and chest illness was then established in the allergic and non-allergic groups for both dust-exposed and non-dust-exposed persons. It was found that these clinical phenomena were commoner in dust-exposed persons. In addition, there is evidence that a personal history of an allergy parameter renders the person more liable to develop chronic bronchitis or other chest conditions investigated. This is much less definite in the case of a history of allergy in a blood relation. This difference was not accounted for by differences in smoking habit. (Auth. Abs. Mod.)

71-0283. Teculescu, D. B., Stanescu, D. C. **Lung Diffusing Capacity. Normal Values in Male Smokers and Non-Smokers Using the Breath-Holding Techniques.** *Scandinavian Journal of Respiratory Diseases* 51(3):137-149, 1970.

Breath-holding measurements of lung diffusing capacity were carried out in 89 healthy males (42 smokers). Age, anthropometric, and spirographic values were similar in smokers and nonsmokers; the lung diffusing capacity, lung permeability, and diffusion constant were significantly lower in smokers. A normal distribution of the diffusing capacity and diffusion constant was found. Prediction equations were developed for D_L (based on age and height or BSA), D_LV_A, and K (on age) for smokers and nonsmokers separately. The causes of the difference between smokers and nonsmokers are discussed. (Auth. Abs.)

71-0284. Ulrich, L., Malik, E. **Chronic Bronchitis in Agricultural and Chemical Workers.** *Arhiv za Higijenu Rada i Toksikologiju* 21(1):35-47, 1970.

An epidemiological study of chronic bronchitis was made in a group of 1193 randomly sampled agricultural workers and 268 chemical workers in Bratislava. The prevalence of bronchitis amounted to 19.8 percent in farmers and 31.7 percent in chemical workers. According to sex and smoking habit, the rate of bronchitis was, as expected, more than, three times higher in males than in females, the relation of smokers to nonsmokers being the same. The residence factor (north, south) seemed to be a much weaker influencing factor than sex and smoking habit, but more pronounced differences were found in the distribution pattern of particular syndromes, such as simple bronchitis and recurrent bronchitic exacerbations. The distribution pattern shows an increase in the prevalence of persistent cough in chemical workers as compared with agricultural workers. A striking decrease in the prevalence rate of the recurrent exacerbating form of bronchitis in chemical workers also deserves mention. The unfavorable influence of smoking on the prevalence of bronchitis seems to be equally pronounced in both groups.

71-0285. Yamanaka, A. **Pulmonary Emphysema in Japan.** *Pathologia et Microbiologia* 35(1/2):161-166, 1970.

The results of 489 autopsies to determine the presence and degree of chronic pulmonary emphysema and aged lung are reported along with histological findings. A new concept of pulmonary emphysematosis is introduced and problems concerning age distribution, sex incidence, air pollution, smoking and pulmonary cancer are briefly discussed. A distinct increase of chronic emphysema among heavy smokers was found.

71-0286. Zivy, P., Fournier, E. **Tabagisme, Emphyseme Bulleux et Pneumothorax Spontane (P.S.I.) Idiopathique. [Tobaccoism, Bullous Emphysema and Spontaneous Idiopathic Pneumothorax.]** *Annales de Medecine Interne* 121(12):1049-1056, December 1970, French.

Prolonged experimental inhalation of cigarette smoke causes a chronic toxic tobacco lung with cortical emphysema. Tobacco lungs of heavy inhaling smokers usually present an evolutive bilateral bullous apicitis. The other etiologic factors, vary from case to case, inhalation of smoke often being preponderant. The analysis of 61 cases of spontaneous idiopathic pneumothorax defines the role of inhalation smoking. It is discreet in the cases occurring before the age of 26 years: there, it acts like classical spontaneous pneumothorax of the young, whose etiology is dominated by congenital, endocrinometabolic conditions and by conditions linked with growth. Paralleling the increase in cigarette consumption, spontaneous pneumothorax is observed more frequently today in the 30 to 50 year age groups, than formerly resulting from bullae, aggravated, if not caused, by inhalation smoking. This probably disturbs the lipidic- and surface-tension alveolar functions, a conditioni intervening in the genesis and development of the bullae. Smokers in which a spontaneous idiopathic pneumothorax occurs, in comparison with the others, present a higher ponderal deficit, usually reversible after 25 years of age, after discontinuance of smoking. Like the lesions of tobacco lung when they assume an unusual importance, the condition can be the result of an immunological alveolar disorder linked with inhalation smoking. Toward the fifties, this precipitates emphysematous involution and can lead to severe respiratory insufficiency. Inhalation smoking considerably aggravates the prognosis, especially functional, of respiratory diseases, particularly tuberculosis.

See also, **71-0186, 71-0192, 71-0228, 71-0233, 71-0244, 71-0260, 71-0299**

CARDIOVASCULAR DISEASES

71-0287. Aronow, W.S. **The Effect of Smoking Cigarettes on the Apexcardiogram in Coronary Heart Disease.** *Chest* 59(4):365-368, April 1971.

Twenty men smokers with coronary heart disease had apexcardiograms performed before and immediately, two, four, and six minutes after smoking two high-nicotine cigarettes, two low-nicotine cigarettes, and two non-nicotine lettuce leaf cigarettes. The mean maximum increase in A wave ratio above the base line level was 6 percent after smoking the non-nicotine cigarettes, 13 percent after smoking the low-nicotine cigarettes, and 34 percent after smoking the high-nicotine cigarettes. The mean A ratio was significantly increased immediately after smoking the non-nicotine cigarettes, immediately, two, and four minutes after smoking the low-nicotine cigarettes, and immediately, two, four, and six minutes after smoking the high-nicotine cigarettes. Smoking cigarettes increased myocardial ischemia, causing an increase in left ventricular A wave, reflected by a larger A wave ratio in the apexcardiogram. (Auth. Abs.)

71-0288. Ayres, S. M., Giannelli, S. (Jr.), Mueller, H. **Myocardial and Systemic Responses to Carboxyhemoglobin.** *Annals of the New York Academy of Sciences* 174 (Art. 1):268-293, October 5, 1970.

Measurements of alveolar-capillary gas exchange, systemic hemodynamics, and myocardial metabolism were made in a series of human and canine studies before and after the administration of amounts of either 5 or 0.1 percent carbon monoxide, sufficient to raise carboxyhemoglobin (COHB) saturation to between 5 and 25 percent. Arterial and mixed venous oxygen tensions were decreased by administration of either concentration, and changes could be identified with COHB saturations below 5 percent. Cardiac output and minute ventilation increased when COHB was elevated by breathing the higher concentration. The coronary arteriovenous oxygen difference was uniformly decreased and coronary blood flow increased when COHB was raised to between 5 and 10 percent saturation with either gas mixture in the human studies. Certain patients with coronary artery disease developed altered lactate and pyruvate metabolism following elevation of COHB suggesting myocardial hypoxia. Significant myocardial changes were seen in patients with elevation of COHB above 6 percent COHB. The canine preparation, in contrast, was notably more resistant to COHB, and significant alterations were not observed until COHB saturation exceeded 25 percent. Studies showing similar myocardial and systemic hemodynamic effects of carbon monoxide in cigarette smokers are reviewed. (Auth. Abs. Mod.)

71-0289. Bahl, A. L., Basu, T. K., Chugh, R. N. **Precocious Ischemic Heart Disease. Evaluation of Different Risk Factors.** *Indian Journal of Medical Sciences* 24(11):722-728, November 1970.

This study was conducted to identify and evaluate the various possible risk factors in precocious coronary heart disease. Fifty-seven patients below 40 years with a diagnosis of coronary heart disease and 50 healthy subjects in the same age groups were included in this prospective study. The disease was most prevalent in males between 35 and 39 years of age. High serum cholesterol, smoking, occupational and emotional stress, caloric intake greater than 2400 calories per day, a high animal fat intake and diabetes mellitus were the most important risk factors in the development of coronary heart disease, while a positive family history of coronary heart disease, cerebrovascular disease, hypertension, high saturated fat intake and a high cholesterol:lipid phosphorus ratio were less important as risk factors. Type of occupation, socioeconomic status, overweightness and degree of physical activity were not considered to be important risk factors. (Auth. Abs. Mod.)

71-0290. Berkson, D. M., Stamler, J., Lindberg, H. A., Miller, W. A., Stevens, E. L., Soyugenc, R., Tokich, T. J., Stamler, R. **Heart Rate: An Important Risk Factor for Coronary Mortality – Ten-Year Experience of the Peoples Gas Co. Epidemiologic Study (1958-68).** In: Jones, R. J. (Editor). *Atherosclerosis. Proceedings of the Second International Symposium.* New York, Springer-Verlag, 1970, pp. 382-389.

In a ten-year perspective epidemiologic study of middle-aged men of the Peoples Gas, Light and Coke Company of Chicago, resting heart rates of 80 and greater were found to be associated with sizeable increases in risk of dying over the next ten years from all causes, including all cardiovascular-renal diseases, coronary heart disease, and sudden death. These associations were independent of coexistent diseases, ECG abnormalities, and other major coronary risk factors (hypercholesterolemia, hypertension, cigarette smoking, overweight). A faster heart rate is apparently an independent coronary risk factor. (Auth. Abs. Mod.)

71-0291. Breysse, P. A., Bovee, H. H. **Use of Expired Air–Carbon Monoxide for Carboxyhemoglobin Determinations in Evaluating Carbon Monoxide Exposures Resulting From the Operation of Gasoline Fork Lift Trucks in Holds of Ships.** *American Industrial Hygiene Association Journal* 30(5):477-483, September-October 1969.

Exposures of longshoremen to carbon monoxide from fork lift trucks used in holds of ships were evaluated by use of the expired air method for determining carboxyhemoglobin. Results indicated that if the net increase in carboxyhemoglobin was considered, then the hazards potential of utilizing gasoline driven fork lifts in the holds would be considered of low order of magnitude. Moderate to heavy cigarette smoking was probably as important a factor in individual carbon monoxide adsorption as being exposed to CO at the Threshold Limit Value (TLV). (Auth. Abs.)

71-0292. Dalderup, L. M., Van Haard, W. B., Keller, G.H.M., Zwartz, J. A., Visser, W., Schouten, F., De Metz, H. **Sugar Consumption, Physical Activity, Smoking, and Serum Composition in Man.** *Voeding* 32(1):41-62, January 15, 1971.

The results of this pilot study point strongly to physical activity as the factor playing a key role in the blood lipid concentrations, the blood coagulation and the fibrinolysis time. Lack of physical activity in combination with a high score for smoking, and for alcohol consumption in combination with smoking, must be considered to be a dangerous combination with regard to the risk of myocardial infarction and thrombosis. Smoking increases the risk especially by a distinct inhibition of the blood fibrinolysis activity, but also by elevating a number of the blood lipid fractions. An advisable amount of physical activity has been estimated roughly to be at least 25 Cal/kg body weight. This means spending about an equal amount of calories for various daily activities and sports as one's basal metabolic rate. The exceptions to this rule within the group are found almost exclusively among the smokers. The dietary composition did not play a large role in the variation of the blood lipid levels. Neither the sugar, not the fat content of the diet was important, only the total carbohydrate content showed more or less distinct inverse relations with the blood lipid levels. There is an obvious need to study the activity of a number of enzyme systems in relation to physical activity and smoking. From comparisons with data from the literature it is also clear, that acute and chronic effects of a higher sugar consumption are to be studied separately; a simple extrapolation of acute to chronic effects is impossible. For epidemiological studies on cardiovascular diseases and abnormally high blood lipid levels, the estimation of the energy spent per kg of body weight is expected to be very useful.

71-0293. Dawber, T. R., Thomas, H. E. (Jr.) **Prevention of Myocardial Infarction.** *Progress in Cardiovascular Diseases* 13(4):343-360, January 1971.

The possible methods of preventing myocardial infarction are discussed. The desirability of prevention in the total problem of myocardial infarction is stressed. The methods consist of the prevention of the underlying coronary atherosclerosis, and the secondary prevention of myocardial ischemia contributed by other factors than those presumed to relate to atherosclerosis. In the primary prevention of coronary atherosclerosis the two major risk factors are elevation of serum lipids and of blood pressure. The benefits to be achieved by reduction of elevation of both of these abnormalities are discussed. Both require a long-term approach starting as early in life as possible. The major methods of prevention or retardation of coronary ischemia irrespective of coronary artery disease involve discontinuance of cigarette-smoking and a program of increased physical activity. In addition, prevention or correction of polycythemia, anemia or hypercoagulability should be included. The use of oxygen, in higher percentage or at higher pressure than in the atmosphere, surgical intervention to improve the myocardial blood supply and pharmacologic agents to improve myocardial metabolism are also considered. Quantitation of the benefit of preventive programs is still impossible. Benefit from lowering blood lipids and blood pressure requires long-term therapy begun early in life. Discontinuance of cigarette smoking and increasing the amount of physical activity offer reasonable assurance of immediate benefit. So also does correction of hematologic abnormalities. Pharmacologic agents and surgery to improve coronary blood flow still require further evaluation. (Auth. Abs.)

71-0294. Gupta, R. S., Madan, B. R. **Effect of Ganglion Blocking Agents on Spontaneous and Adrenaline-Induced Ventricular Ectopic Tachycardia Following Coronary Occlusion.** *Indian Journal of Experimental Biology* 8(3):198-200, July 1970.

Antiarrhythmic effects of tetraethylammonium (TEA), hexamethonium (C6), and nicotine have been studied in conscious dogs on the first and third post-operative days after a 2-stage ligation of the anterior descending branch of the left coronary artery. The dosage of nicotine, 50 micrograms/kg, is within the range systematically absorbed as a result of cigarette smoke inhalation. TEA and C6 suppressed the spontaneous ventricular ectopic tachycardia on the 1st post-operative day and adrenaline-induced exaggerated ectopic response on the 3rd post-operative day; nicotine aggravated these arrhythmias. The possible mechanism underlying antiarrhythmic action of TEA and C6 and arrhythmogenic effect of nicotine appears to be mediated through their influence on calcium ion transfer across the cardiac cell membrane. (Auth. Abs. Mod.)

71-0295. Haust, M. D., More, R. H. **Spontaneous Lesions of the Aorta in the Rabbit.** In: Roberts, J. D. (Jr.), Straus, R. (Editors). *Comparative Atherosclerosis. The Morphology of Spontaneous and Induced Atherosclerotic Lesions in Animals and its Relation to Human Disease.* New York, Harper and Row, 1965, pp. 255-275.

The conventionally recognized spontaneous lesions of the rabbit aorta are not of an atherosclerotic variety, and there is general agreement that they resemble somewhat the changes seen in Monckeberg's medical sclerosis. The lesions reported by Ophuls and Nuzum *et al.* were not found by others, and there is some doubt whether they were, indeed, spontaneous. Even if lesions described by Ssolowjew and Bragdon were observed by other investigators, they could hardly pass as typical of the atherosclerotic process. Ssolowjew describes finely dispersed fat in the intercellular substances of the vessel. It is not uncommon to find such fine fat deposition in perfectly normal human aortas. The lesions described by Bragdon, if present, are transient and seem not to go on to development into an atherosclerotic focus. It is difficult to assess the significance of the lesion referred to above as "polypoid" and interpreted by Lopes de Faria as a healing dissecting aneurysm, though it is reminiscent of a human atherosclerotic plaque. It is also difficult to make any statements in reference to the finding of microthrombi. More data will be necessary before any significance can be attached to these observations. It may be stated in conclusion that no spontaneous atherosclerotic lesions are found in the rabbit aorta.

71-0296. Kandaswamy, S. **An Analysis of Coronary Disease in 150 Cases of Chest Pain.** *Antiseptic* 67(12):936-940, December 1970.

The incidence of coronary disease in 150 patients with chest pain is analyzed with special reference to such important etiological factors as excessive smoking, physical inactivity, heredity, obesity, hypertension, diabetes and excessive fat intake.

71-0297. Kannel, W. B. **The Framingham Study and Chronic Disease Prevention.** *Hospital Practice* 5(3):78-94, March 1970.

Some of the principal coronary heart disease (CHD) findings of the Framingham study are reviewed. The study showed that the risk of death rises as living habits become more sedentary, but risk of angina or coronary insufficiency is unrelated to lack of physical activity. Angina risk rises progressively with weight, but risk of nonfatal myocardial infarction does not. The number of cigarettes smoked daily, not duration of habit, raises the risk of CHD. The contribution of cigarette smoking appears to be independent of blood pressure, vital capacity or serum cholesterol value. At any level of these factors, smokers have an excess risk of CHD. The effect is transient, reversible, and noncumulative and those who give up the habit can expect to revert promptly to the nonsmoking low risk. Living habits apparently unrelated to excess CHD risk include moderate amounts of alcohol and coffee, marital status, and family size. Biologic factors incriminated include a variety of serum lipids, hypertension, diabetes and ECG abnormalities. Diminished vital capacity, cigarette smoking and diabetes carry an excess risk of stroke, especially if there is cardiac enlargement.

71-0298. Kradjian, R., Bowles, L. T., Edwards, W. S. **Peripheral Arterial Disease in Ceylon.** *Surgery* 69(4):523-525, April 1971.

A total of 54 patients (51 men and 3 women) with peripheral arterial occlusive disease were studied in Ceylon. There was a much earlier average age of onset and a more distal localization of the occlusive lesions than are usually seen in patients of North America. All the men studied were heavy smokers, most smoking Beedi, an inexpensive Indian cigarette. The pathological lesions examined were often atherosclerotic in the larger arteries but usually thrombotic more peripherally. This was unlike thromboangiitis obliterans (Buerger's disease) in that there were no episodes of superficial phlebitis. Recent pathological studies suggest the possibility that heavy smoking can cause an accelerated coagulative tendency with deposition of fibrin on arterial walls with incorporation of this fibrin to develop atherosclerotic plaques in larger arteries and thrombotic occlusion of smaller arteries. (Auth. Abs.)

71-0299. Outhred, K. G., McKenzie, H. I., White, K. H. **Some Findings on the Post-Mortem Association of Right Ventricular Wall Thickness and Chronic Obstructive Bronchitis, Pneumoconiosis, Emphysema and Tuberculosis.** *Medical Journal of Australia* 2(21):950-954, November 21, 1970.

In a post-mortem series from New South Wales coal miners, averaged measurements of right ventricular wall thicknesses were made, the thickness of the non-septal portion having been measured at five levels. These data were correlated against assessed grades of chronic bronchitis derived from measurements of the Reid index and the wall-lumen ratio in the same subjects. These gradings correlated well with documented ante-mortem symptoms and signs and with bronchitis gradings based thereon. Not only was pronounced right ventricular hypertrophy invariably present in moderate and severe grades of chronic obstructive bronchitis, but there was evidence of a continuous spectrum of hypertrophy with minor degrees being present at the earlier stages of chronic bronchitis. Strong associations were also demonstrated between right ventricular hypertrophy and such pathological conditions as coal workers' pneumoconiosis and post-tuberculous fibrosis. There was no association between right ventricular hypertrophy and the extent of emphysema in the lungs; even at advanced grades of emphysema, no right ventricular hypertrophy was noted, unless a cause other than emphysema were present. There was some evidence that certain conditions, for example carcinoma of the lung, asthma, bronchiectasis with middle-lobe syndrome, late effect of extensive thoracic injury, extensive organized pulmonary thrombosis, etc., may have been partly associated with right ventricular hypertrophy. (Auth. Abs.)

71-0300. Pernod, J. **Frequence et Etiologie de la Maladie Coronarienne. [Incidence and Etiology of Coronary Disease.]** *Cahiers de Medecine* 11(16):1431-1437, December 30, 1970, French.

The various factors which can influence the incidence of coronary disease (sex, age, geographic distribution, heredity, diabetes, cholesterol and disturbances of lipid metabolism, obesity, gout and uricemia, physical activity, nervous stress, and tobacco) have been reviewed. Select data from the Framingham–Albany Study and other studies illustrate the role of tobacco in increasing the risk of the disease. Despite some minor disagreement in one statistic or another, there is no disagreement regarding the role of the more important risk factors. Thus, although there is a lack of knowledge concerning the etiology of coronary atherosclerosis, one can define the factors for the utilization of preventive measures.

71-0301. Rissanen, V. T. **Occurrence of Coronary Occlusion in Cases of Coronary Death and Accidental Death.** In: Halonen, P. I., Louhija, A. (Editors). Thrombosis and Coronary Heart Disease. First Paavo Nurmi Symposium, Porvoo, Finland, 1969. *Advances in Cardiology* 4:99-111, 1970.

The prevalence of occlusive coronary artery disease and coronary thrombosis was studied in cases of accidental death and sudden cardiac death in males. An obvious increase with age in the extent of occlusive coronary disease was established in accidental deaths. The difference in degree of occlusive coronary disease between cardiac deaths and accidental deaths was significant when estimated on the basis of the occurrence of marked stenosis, total occlusion and thrombosis, and on the basis of the 'obstructive score' describing the occurrence of stenotic or occlusive lesions in the coronary arterial tree. A difference, although less distinct, was also demonstrated in the items mentioned between cardiac deaths with and without a previous history of coronary heart disease. The obstructive score and the prevalence of total occlusion were higher in cases of cardiac death showing recent or old myocardial infarcts as compared to cardiac deaths without detectable infarcts. (Auth Abs.)

71-0302. Samaggia, S., Soverini, A., Zincati, G. **L'Abitudine al Fumo di Sigaretta nei Colpiti da Infarto del**

Miocardio. [Cigarette Smoking Habits in Subjects With Myocardial Infarction.] *Cardiologia Pratica* 1 (Supplement):120-124, 1967, Italian.

The cigarette smoking habits of 237 subjects with myocardial infarction were studied. Cigarette smoking was noted to be a frequent habit in subjects with coronary heart disease and patients who contracted the disease at an early age were as a rule heavy smokers. Cigarette smoking was concluded to play an important role in causing coronary heart disease. (Auth. Abs. Mod.)

71-0303. Tibblin, G. **Risk Factors in Coronary Heart Disease.** In: Halonen, P. I., Louhija, A. (Editors). Thrombosis and Coronary Heart Disease. First Paavo Nurmi Symposium, Porvoo, Finland, 1969. *Advances in Cardiology* 4:123-130, 1970.

Various risk factors in coronary heart disease, including age, blood lipids, blood pressure, blood sugar, serum uric acid, hematocrit, obesity, smoking and physical activity, as well as interactions between these factors, were examined in a group of 834 urban Swedish men, all born in 1913. Blood lipids, blood pressure, smoking and low physical activity were the most important risk factors in these men. However, one or two of these factors seldom produced a case of myocardial infarction. But when three or four factors were present, the incidence rose considerably. An attempt to relate the incidence of three different manifestations of coronary heart disease (myocardial infarction, angina pectoris and new ECG findings) to increased numbers of risk factors was unsuccessful since the three manifestations should not have been combined into a common group when associations with different factors were examined, but studied separately.

71-0304. Ziegler, E. **Die Beziehungen zwischen kardiovaskularer Sterblichkeit und Zuckerkonsum in der Schweiz. [The Relationship Between Cardiovascular Mortality and Sugar Consumption in Switzerland.]** *Schweizerische Rundschau fur Medizin* 60(10):298-303, March 9, 1971, German.

The relation between cardiovascular mortality and two food factors, sugar and fat, were investigated in the light of Swiss statistics of the years 1900 to 1968. The development of atherosclerosis mortality of this period shows an obvious parallelism with that of the sugar climate (K_{30}), not, however, with that of the fat consumption and the smoking of cigarettes. Between the ischemic heart disease and cerebral atherosclerosis mortality and the sugar and fat consumption from 1942 to 1968, there are significant correlations. (Auth. Abs.)

See also, **71-0206, 71-0234, 71-0244, 71-0338**

OTHER DISEASES AND CONDITIONS

71-0305. Beal, V. A. **Nutritional Studies During Pregnancy.** *Journal of the American Dietetic Association* 58(4):321-326, April 1971.

Data were analyzed for ninety-five pregnancies in fifty-four women as part of a longitudinal study of the growth and development of their children. The women were white, middle-class, and primarily of northern European extraction. All infants were live single births. The records of five women who delivered prematurely showed no unusual patterns. The women were generally well nourished prior to and during pregnancy, although there were wide individual variations. No significant correlations were found between maternal intake of calories, carbohydrate, fat, protein, or calcium and the length or weight of the infant at birth. A significant correlation was found between caloric intake in the second trimester and total weight gain during pregnancy. Birth length was significantly correlated with maternal preconceptional weight and with weight gain in the third trimester. Smaller correlations were found between birth weight and maternal weight and weight gain. Women who were heavier preconceptionally and women with large weight gains during pregnancy tended to bear infants who were both longer and heavier. Birth size was not related to parity. Women who smoked gave birth to infants with lower mean birth weights than did nonsmokers, despite higher average caloric intakes and no significant difference in length of gestation. A study of repeated pregnancies in the same women revealed a high positive correlation in weight gain, with a mean difference of only 4.5 lb. in gain from one pregnancy to another. (Auth. Abs.)

71-0306. Bynum, T. E., Ruoff, P. A., Richert, J., Wolf, S. **The Smoke Reflex in Rabbits. An Example of Autonomic Control of Cardiorespiratory Function.** *Conditional Reflex* 5(4):233-240, October-December 1970.

This study was undertaken to elucidate aspects of autonomic behavior as reflected in the "smoke reflex" in rabbits. Allowing smoke to envelop the nostrils of a rabbit resulted in prompt apnea, bradycardia, diminution of peripheral pulse and elevation of systemic blood pressure. Atropine and vagotomy, or both, mitigated the bradycardia, but the combined effect of propranolol and vagotomy was required to abolish bradycardia. Phenoxybenzamine (dibenzyline) alone blocked only the peripheral vasoconstriction and pressor response. The combination of vagotomy, propranolol and phenoxybenzamine blocked all manifestations of the reflex with the exception of apnea. A classical concept holds that responses of the autonomic nervous system must be either distinctly adrenergic (sympathetic) or cholinergic (parasympathetic), and that visceral regulation is achieved by an antagonism between the two. This study introduces contrary evidence and demonstrates that in certain adaptive behavior there is a patterned response that includes activation of discrete elements of both cholinergic and adrenergic divisions, as well as inhibition of one component of the latter. (Auth. Abs.)

71-0307. Chisholm, I. A., Bronte-Stewart, J., Awduche, E. O. **Colour Vision in Tobacco Amblyopia.** *Acta Ophthalmologica* 48(6):1145-1156, 1971.

A defect of color discrimination is a consistent feature of tobacco amblyopia. In the untreated condition the defect takes the form of an irregular depression of color discrimination in most regions of the spectrum. Poor color discrimination was found to be related directly to poor visual acuity and increased age. Sixty patients were treated with parenteral hydroxocobalamin and continued smoking. Five patients stopped smoking as their only form of therapy. When the disease was associated with pernicious anemia, the rate of visual improvement was slower than that when diabetes was the associated condition. When there was no associated disease, the rate of visual improvement with hydroxocobalamin was as good as that obtained when smoking was stopped. (Auth. Abs.)

71-0308. Ciuca, A., Sanda, M. **Fattori Sociali Dell'Invecchiamento. [Social Factors of Aging.]** *Medicina Sociale* 20(4):101-104, April 1970, Italian.

The psychological and social factors (family, work, consumption of alcohol and tobacco, standard of living, mental stress) which accelerate aging are reviewed and the means for preventing the negative action of these factors are discussed. (Auth. Abs.)

71-0309. Cohen, M. M., Debas, H. T., Holubitsky, I. B., Harrison, R. C. **Effect of Nausea on Human Gastric Secretory Responses.** *Digestive Diseases* 16(2):156-159, February 1971.

In three healthy young adults, cigarette smoking was found to have no significant effect on the pentagastrin-stimulated submaximal plateau of acid or pepsin secretion. When smoking was accompanied by nausea, the output of both acid ($P < 0.0025$) and pepsin ($P < 0.025$) was significantly inhibited. The conclusion was reached that nausea is a potent inhibitor of the gastric secretory response in man. (Auth. Abs.)

71-0310. Drexler, J. **Asymptomatic Polyps of the Colon and Rectum. III. Proximal and Distal Polyp Relationships.** *Archives of Internal Medicine* 127(3):466-469, March 1971.

Four hundred and fifty-six distal polyps were detected in 160 (53 percent) of 300 patients over 45 years of age examined by routine proctosigmoidoscopy after July 1, 1965. Sixty-five percent of these lesions were multiple, 97 percent were 5 mm or less in size, and 75 percent were located in the middle third segment of the rectocolon visualized. Sixteen proximal polyps were revealed in 8 (3.8 percent) of 211 patients examined by roentgenogram of the colon. Half of these lesions were less than 1 cm in size. Higher up polyps were roentgenologically demonstrated in patients with distal polyps almost twice as frequently as in those with normal results of endoscopy. A significantly higher incidence of both distal and proximal polyps was found in cigarette smokers and ex-smokers as compared with nonsmokers. Selecting smokers rather than those with distal polyps for subsequent procedures should efficiently increase the yield of benign adenomatous polyps, at half cost of similar studies in an unselected population. (Auth. Abs.)

71-0311. Kowalski, C. J. **Relationship Between Smoking and Calculus Deposition.** *Journal of Dental Research* 50(1):101-104, January-February 1971.

The chi-square test for association in contingency tables is often used to analyze data gathered during the course of dental/oral experimentation. A simple procedure that makes such analyses more useful is described, and the method is applied in a study of the relationship between smoking and calculus deposition in 568 nonsmokers, 1,798 smokers of more than 10 grains per day and 3,324 smokers of less than 10 grains per day. The results showed that the chances of having no calculus, supragingival calculus and subgingival calculus did not differ in the two groups of smokers. Calculus formation was influenced by the fact of smoking rather than the amount smoked. The probability of being calculus-free was greater for nonsmokers than for either group of smokers, whereas the probabilities of supragingival and subgingival calculus among nonsmokers were less than for the average smoker. Subgingival calculus was affected less by no smoking or heavy smoking than the two other categories, no calculus and supragingival calculus.

71-0312. Phillips, C. I., Ainley, R. G., Van Peborgh, P., Watson-Williams, E. J., Bottomley, A. C. **Vitamin B_{12} Content of Aqueous Humor. (Letter)** *Nature* 217(5123):67-68, January 6, 1968.

The vitamin B_{12} content of the aqueous humor of the eye was determined in samples from 16 patients having cataract extraction in order to verify if abnormally low values of vitamin B_{12} in the aqueous humor could be found in patients suffering from tobacco amblyopia. The mean aqueous concentrations of vitamin B_{12} were 20.2 pg/ml for the smokers and 34.3 pg/ml for the nonsmokers. These observations may be relevant in the elucidation of the pathogenesis of tobacco amblyopia.

71-0313. Procianoy, G., Maulaz, P. B., Schlee, J. C. **Influencia do Fumo Durante a Gestacao Sobre o Recem-Nascido. Resultados e Conclusoes da Observacao Humana e da Experimentacao Animal. [Influence of Smoking During Pregnancy on the Neonate. Results and Conclusions on Human Observations and Animal Experiments.]** *Pediatria Pratica* 41(7/8):259-268, 1970, Portuguese.

On the basis of an investigation among pregnant women and an experimental work on pregnant rats, smoking was concluded to have a negative effect on the weight, height and size of the newborn. There were no histopathologic changes in the newborn of the rats. (Auth. Abs. Mod.)

71-0314. Speer, F. **Passenger Smoking Effects on Bus Drivers. (Letter)** *Archives of Environmental Health* 22(4):512, April 1971.

This letter-to-the-editor, in regard to passenger smoking effects on bus drivers, reports that a questionnaire survey of 71 nonallergic, nonsmoking men found that 76 percent suffered from such symptoms as eye irritation, cough, wheezing and headache when exposed to tobacco smoke.

71-0315. Thompson, J. H., Angulo, M., Spezia, C. A. **Rat Gastric Secretion and Mucosal Serotonin Following Chronic Oral Nicotine Ingestion.** *Research Communications in Chemical Pathology and Pharmacology* 1(6):721-732, November 1970.

Gastric secretion and gastric mucosal serotonin were measured in the basal state and following atropine, in two-hour pylorus-ligated Sprague-Dawley male rats after two weeks of exposure to nicotine in drinking water. Gastric secretion was increased by chronic exposure to nicotine. Atropine (100 micrograms/kg) reduced gastric secretion equally in control and nicotine treated rats. Gastric mucosal serotonin, expressed either in micrograms/g mucosa, or micrograms/tissue, was significantly reduced by nicotine exposure. It is suggested that the increase in gastric secretion is related to depletion of mucosal serotonin. (Auth. Abs.)

71-0316. Vos-Brat, L.C., Rumke, P. **Immunoglobuline Concentraties, PHA Reacties van Lymfocyten** ***In Vitro*** **en Enkele Antistof Titers van Gezonde Rokers. [Immunoglobulin Concentrations, Hemagglutinin (PHA) Responses of Lymphocytes** ***In Vitro*** **and Some Antibody Levels in Healthy Smokers.]** *Jaarboek Kankeronderzoek en Kankerbestrijding* 19:49-53, 1969, Dutch.

The possible influence of smoking on the immune state was investigated in 75 heavy smokers (15 or more cigarettes per day for 20 years). These were compared with 50 nonsmokers. All were male office employees, 45-55 years of age. The IgG serum concentrations and the response of lymphocytes to PHA were significantly lower in the smokers than in the nonsmokers. The number of leukocytes was significantly greater in the smokers than in the nonsmokers. (Auth. Abs. Mod.)

71-0317. Weiss, W. **How Smoking Affects Hearing.** *Medical Times* 98(11):84-89, November 1970.

The health maintenance examinations of a consecutive series of 97 older male executives were reviewed for evidence of a relationship between smoking habits and hearing loss in the pure tone audiogram. Heavy cigarette smokers had a higher prevalence of hearing loss than nonsmokers and light smokers. The loss was limited to low frequencies, 250 and 500 cycles per second, and to a mild degree of abnormality. These findings are consistent with the hypothesis that cigarette smoking is associated with a conductive hearing defect, most likely due to involvement of the eustachian tube. (Auth. Abs.)

71-0318. Wilson, J., Linnell, J. C., Matthews, D. M. **Plasma-Cobalamins in Neuro-Ophthalmological Diseases.** *Lancet* 1(7693):259-261, February 6, 1971.

Plasma-cyanocobalamin levels were found to be significantly raised in Leber's hereditary optic atrophy, dominantly inherited optic atrophy, tobacco amblyopia, and sporadic cases of optic atrophy. The mean total vitamin-B_{12} concentration in the normal non-smoker group was 465 pg per ml, and similar mean concentrations were found in all groups except patients with Leber's disease (nonsmokers) or with West Indian amblyopia (both nonsmokers and smokers). The levels may be evidence of inborn metabolic errors of cynaide detoxication, varying clinically and genetically according to the particular enzyme involved. (Auth. Abs. Mod.)

See also, **71-0188, 71-0212, 71-0223, 71-0224, 71-0231, 71-0239, 71-0242, 71-0248, 71-0321, 71-0325**

BEHAVIORAL AND EDUCATIONAL RESEARCH

71-0319. Anderson, J. P. **Smoking in Postgraduate Medical Centres. (Letter)** *British Medical Journal* 1(5748):558, March 6, 1971.

Questionnaires sent to all known postgraduate medical centers in England and Wales in 1967 and again in 1969 show how many allow smoking in meetings and the low priority accorded to reconsideration of their policies on smoking in meetings, during the 18 months between the two questionnaires.

71-0320. Ball, K. **Cigarette Smoking and the Responsibility of the Hospital Physician.** *British Journal of Hospital Medicine* 4(6):865-866, December 1970.

Hospital physicians have the responsibility to help their patients stop smoking, to control smoking in hospitals and to encourage the reduction of cigarette smoking in the community. In helping their patients to quit smoking, each physician should develop his own technique, but it should convey to the patient, the physician's conviction that smoking is hazardous. The values of antismoking clinics, the banning of smoking and sales of cigarettes in hospitals, and the nonsmoking physician are discussed.

71-0321. Bender, W., Gothert, M., Malorny G., Sebbesse, P. **Wirkungsbild niedriger Kohlenoxid-Konzentrationen beim Menschen. [Effects of Low Carbon Monoxide Concentrations in Man.]** *Archiv fur Toxikologie* 27(2):142-158, 1971, German.

In experiments on healthy volunteers 19 to 34 years of age seated quietly in a closed chamber of 1.5 m^3 capacity continuously circulated with a mixture of air and CO, the uptake and psychological effects of carbon monoxide during and after exposure were investigated. After 8 hours of breathing 100 ppm CO, a concentration of 93 ppm was measured in expiratory alveolar air, demonstrating that diffusion equilibrium in the organism had not yet been attained. The highest concentration of CO-Hb measured under these experimental conditions was 11.6 percent. It was calculated by applying the law of mass action that only within a limited range of CO concentrations is there an approximate linear relation between the CO concentration in expired air and the CO-Hb content of blood. Any conclusions as to the CO-Hb content of blood drawn from the known CO concentration of expired air assuming a linear correlation between the two over a greater range of concentrations are bound to be burdened with considerable error, since in reality the relationship between the two quantities is an exponential one. On the basis of tests carried out on a random sample of 42 students, it could be shown that carbon monoxide inspired in concentration of 100 ppm for 2 1/2 hours resulted in a statistically significant diminution of visual perception, manual dexterity, ability to learn and perform certain intellectual tasks. At this time, the measured CO concentration in alveolar air was 55 ppm and the CO-Hb level was 7.2 percent. Subjective symptoms were generally absent. Smokers and nonsmokers showed no discernable differences in regards to their psychological susceptibility by 100 ppm CO. The observed effects cannot be satisfactorily explained, at least in our present state of knowledge, on the basis of hypoxia alone. (Auth. Abs.)

71-0322. Coe, R. M., Brehm, H. P. **Smoking Habits of Physicians and Preventive Care Practices.** *HSMHA Health Reports* 86(3):217-221, March 1971.

A nationwide sample of 1,591 general practitioners and internists was stratified by location of practice, year of graduation from medical school, and type of practice, in order to study the influence their smoking habits had on preventive care practices. Young physicians more often than older ones believed it was their responsibility to set the example for patients by not smoking and that talking with patients about smoking was valuable. About seven of ten physicians claimed they routinely asked all patients if they smoked, while six of ten advised their patients who smoked to stop. Younger physicians, especially internists, and those with a strong orientation to preventive medicine, significantly more often inquired routinely about smoking or advised patients to stop. In general, physicians who smoked advised their patients less often to stop smoking than did nonsmoking physicians.

71-0323. Dilley, J. W. **Smoking on Campus.** *Journal of the American College Health Association* 19(4):230-234, April 1971.

The smoking habits of 43,172 college students from 50 colleges and universities were studied. Data obtained with relation to sex, incidence, field of study, social environment, dosage, concern about harmful effects, and cessation of smoking are reported and compared with results from previous studies in similar areas. The responsibility of an educational institution with regard to the health habits of the college community is discussed.

71-0324. Driscoll, P., Battig, K. **The Effect of Nicotine and Total Alkaloids Extracted From Cigarette Smoke on Avoidance Behavior in Rats Under Extinction Procedure.** *Psychopharmacologia* 18(3):305-313, November 24, 1970.

The effect of nicotine and total alkaloids extracted from smoke on the avoidance behavior of rats under extinction procedure has been measured in an experiment extended over a period of three months. There was no significant difference between the two substances, with both inhibiting the extinction of avoidance response to approximately the same degree. Significance against the control was achieved with all treatments, the effect being significantly greater with the dose of 0.2 mg/kg than with the two doses of 0.1 or 0.05 mg/kg. (Auth. Abs.)

71-0325. Eastwood, M. R., Trevelyan, M. H. **Smoking and Neurotic Illness.** *Lancet* 1(7690):107-108, January 16, 1971.

During a health screening survey of 1471 middle-aged individuals from a South-East London group practice, each individual completed a questionnaire which included items related to psychiatric state and smoking. The smoking habits of 124 individuals with confirmed psychiatric disorders were compared with those of a demographically matched group which was free from psychiatric illness. No significant differences were found between the two groups for the proportion who smoked, amount smoked per day, or duration of smoking for either sex. There was no significant correlation between the amount smoked per day and psychiatric severity. This study therefore gives no support to the hypothesis that smoking habits are related to neurotic illness. (Auth. Abs.)

71-0326. Fodor, J. T., Glass, L. H. **Curriculum Development and Implementation of Smoking Research – A Longitudinal Study.** *Journal of School Health* 41(4):199-202, April 1971.

During the four-year study, extensive clinical tests were completed which indicated significant immediate effects of cigarette smoking on healthy young males and females. In addition, subjects participating in the clinical phase of the project completed written questionnaires. Significant differences between smokers and nonsmokers were observed in terms of knowledge, attitudes, and practices. An educational program which incorporated findings on the immediate effects of smoking was developed and implemented at the sixth grade level. Significant differences in knowledge were observed between experimental and control groups. An educational program also was developed for the eighth grade level. (Auth. Abs. Mod.)

71-0327. Frith, C. D. **The Effect of Varying the Nicotine Content of Cigarettes on Human Smoking Behavior.** *Psychopharmacologia* 19(2):188-192, January 20, 1971.

Nine subjects were given cigarettes to smoke containing three different amounts of nicotine. It was found that the larger the content of nicotine in the cigarettes offered the smaller was the number smoked during the eight-hour period. A linear relationship between nicotine content and time to smoke a single cigarette was found such that the more nicotine there was in a cigarette, the longer a subject took to smoke it. (Auth. Abs.)

71-0328. Frith, C. D. **Smoking Behavior and Its Relation to the Smoker's Immediate Experience.** *British Journal of Social and Clinical Psychology* 10(1):73-78, February 1971.

The hypothesis that smoking behavior can be determined by the smoker's characteristic level of arousal is tested by means of a questionnaire in which situations inducive of high and low arousal are described. The sample consisted of 59 men and 39 women aged between 18 and 50 and representing a wide range of occupations. In general, it appeared that people had a greater desire to smoke in low-arousal situations. This is consistent with nicotine acting as a stimulant. The finding that heavy smokers have a desire for a cigarette in any situation was not unexpected, but is of importance since this effect will tend to disguise any differential patterns of smoking behavior that may exist. When the data were examined in more detail, evidence appeared for the existence of two extremes of smoking behavior. The men tended to have the highest desire for a cigarette in situations inducing boredom and tiredness, while the women had their highest desire in stress inducing situations.

71-0329. Levitt, E. E. **Reasons for Smoking and Not Smoking Given by School Children.** *Journal of School Health* 41(2):101-105, February 1971.

A questionnaire study was made of 51,507 Indianapolis school children, grades 5 through 12, to determine their reasons for smoking or not smoking. Emotional improvement and habituation given as reasons for smoking showed an increasing trend throughout the grades. Smoking for pleasure declined slowly from a 5th grade high and rose again through the 12th grade. Peer influence as a reason for smoking increased through the elementary grades to an 8th grade peak and then declined to a 12th grade low. To impress others, to imitate adults and to imitate siblings all slowly decreased from early to later grades. Among the reasons for not smoking, health demonstrated a high-low-high curvilinear trend across the grades, while not pleasurable, esthetic reasons, lack of desire, negative effect on performance, undesirable reaction from smoking, peer influence, and personal illness increased from the low to high grades. Expensiveness and the attitude that smoking is senseless behavior also increased over the grades. Parental influence and undesirable effects slowly declined as nonsmoking factors over the school years. One out of ten nonsmokers (15 percent elementary and 2 percent high school children) reported that they did not smoke because they were not old enough. Less than one percent of nonsmokers were deterred by school health classes or health warnings on cigarette packs. However, 66 percent of nonsmokers were deterred by health considerations. The results are compared with those of similar studies.

71-0330. Luban-Plozza, B. **Das Rauchen und die Moglichkeiten der Raucher-Entwohnung. [Smoking and the Possibilities of Giving It Up.]** *Munchener Medizinische Wochenschrift* 112(51):2322-2327, December 18, 1970, German.

Tobacco may be chewed and, in a powder form, snuffed, but cigarette smoking has become its most important form. It appears to correspond best to the nervous unrest and over-activity of contemporary internal uneasiness. Among the stimulating factors of tobacco smoking are the possibilities of using the hands, of sucking and playing with fire, and the fascination of the whole smoking ritual. Among the various methods of giving up smoking, psychotherapy is particularly important. It has been shown to be the most successful method and it can be effectively supplemented by drug therapy, especially with psychodrugs. Ninety-one heavy smokers were treated with Tofranil; most cases began treatment in a hospital. Sixteen of them stopped smoking completely; in 41 the amount of smoking was reduced to less than 1/3 of the original consumption. (Auth. Abs. Mod.)

71-0331. Mitkov, V., Shekerova, N., Vasileva, D. **Nevroticheskaya i Nevrozopodobnaya Zabolevayemost' Rabochikh i Sluzhashchikh Tabachnoy Promyshlennosti v G. Plovdive. [Neurotic and Neurotic-Like Morbidity in Manual and White-Collar Workers in the Tobacco Industry in Plovdiv.]** *Folia Medica* (Plovdiv) 11(6):397-404, 1969, Russian.

Detailed neurological and somatic investigations of 935 employees in the tobacco factories in Plovdiv, representing 20 percent of the total number of employees, revealed that 43.85 percent of the persons investigated suffer from neuroses and neurotic-like conditions. The highest morbidity is found among the workers directly engaged in the manufacture of the tobacco, followed by the clerical and other employees of the auxiliary departments. The percentage of morbidity is higher among women (47.04 percent) than among men (25.71 percent) and this difference is observed in all age groups. Regarding factors such as age, general length of service, and length of service in the manufacture of tobacco, the latter has the more pronounced connection with the indices of morbidity. Among the causes for neurotic morbidity, the patients attribute the greatest significance to domestic factors. More than half (59 percent) of the neurotic and neurotic-like patients have not sought medical help. (Auth. Abs. Mod.)

71-0332. Modern Medicine. **34,627 Physicians Take Part in Smoking Survey.** *Modern Medicine* 38(26):47,49, December 28, 1970.

The third *Modern Medicine* smoking survey, based on responses from 34,627 physicians, reports a steady gain over the past six years for those intent on altering the uses of tobacco products. Responses from two previous surveys are compared statistically with those of the present one indicating, for example, that there are more nonsmoking physicians and more altering their smoking habits away from cigarette smoking now than previously reported. Increased counseling efforts, more optimism regarding the physician's ability to dissuade patients from smoking, and a greater success rate are reported. Of the prime techniques employed for changing the public's smoking habits, physicians rate educational programs first, followed by smoking clinics and tobacco substitutes.

71-0333. Newman, I. M. **Peer Pressure Hypothesis for Adolescent Cigarette Smoking.** *School Health Review* 1:15-18, April 1970.

The friendship patterns of 80 ninth grade students, 40 smokers and 40 nonsmokers of both sexes, were examined to determine conformity of smoking behavior within each group. For both smokers and nonsmokers, a significant relationship existed between smoking behavior and friendship choice. This tendency toward homogeneity was most pronounced for female nonsmokers who were a mutually exclusive group in their friendship selections. These findings, using indirect sociometric techniques, confirm earlier findings using direct questions about friends' smoking behavior, and indicate, especially for female nonsmokers, that the degree of conformity within peer groups is even greater than originally realized. The function of the peer group and the possible use of peer group pressure to support nonsmoking behavior are discussed.

71-0334. O'Rourke, A., Wilson-Davis, K. **Smoking and School Children.** *Journal of the Royal College of General Practitioners* 20(101):354-360, December 1970.

A survey of the smoking habits of 4,502 Dublin school children is reported. Important factors such as age at first smoke, parental influence as reflected by their habits, their approval, and their knowledge, and the significance of social class are statistically analyzed. Other factors, including advertising, peer influence, and differences in habits according to sex are also discussed. An educational health program developed by The Royal College of General Practitioners in which the general practioner plays a direct role as an educator in the schools and in which smoking is treated within the concept of positive health is described.

71-0335. Panminerva Medica. **Campaign Against Smoking Promoted by the Ministry of Health.** *Panminerva Medica* 12(12):474, December 1970.

As part of its antismoking campaign, the Italian Health Ministry has sent a circular to provincial doctors asking for their cooperation with education officials in discouraging smoking among school children.

71-0336. Russell, M.A.H. **Cigarette Smoking: Natural History of a Dependence Disorder.** *British Journal of Medical Psychology* 44(1):1-16, May 1971.

A case is made for regarding cigarette smoking as a dependence disorder that is statistically linked with dependence on alcohol and other drugs. The dependence-producing potential of smoking is currently greater than that of alcohol and barbiturates in that most smokers are dependent smokers, whereas a majority are able to use alcohol and barbiturates intermittently and sensibly. It is only the exceptional two percent who smoke occasionally and intermittently who are truly non-dependent smokers. Furthermore, dependence on smoking can no longer be regarded as 'merely psychological'; most cigarette smokers probably fulfill the criteria for physiological dependence on nicotine, namely tolerance and physical withdrawal effects. The onset of smoking is determined by the interaction of social and psychological factors during adolescence. It takes no more than three or four casual cigarettes in this sensitive period virtually to ensure evolution to regular dependent smoking within a few years. Only about 15 percent of those who have more than one cigarette avoid becoming regular smokers. The matter is largely settled by the age of 20: if a person is a nonsmoker at this age, he is unlikely to take it up. Established smoking is primarily maintained by dependence on the pharmacological effects of nicotine, which are predominantly stimulant but may also be sedative. Eventually, when some of the ill effects of smoking on health are already being experienced, most smokers try to stop, but only about 15 percent succeed before the age of 60. Cigarette smoking is clearly a habit that is easily acquired but difficult to break. In the prevailing social climate, of those who smoke more than a single cigarette during adolescene, some 70 percent continue smoking for the next 40 years. (Auth. Abs.)

71-0337. Scharfenberg, G., Benndorf, S., Kempe, G., Winkelvoss, E. **Arzte und Rauchen. Ergebnisse einer Erhebung der Rauchergewohnheiten und der Stellung zur Raucherentwohnung bei Arzten des Bezirkes Magdeburg. [Doctors and Smoking. Results of an Investigation of the Smoking Habits and of the Attitudes on Smoking Detoxification of Doctors in the Magdeburg District.]** *Deutsche Gesundheitswesen* 25(48):2296-2300, November 26, 1970, German.

Via the Department of Health and Social Affairs at the Council of the District of Magdeburg, the general medical practitioners of this district were anonymously interrogated by means of a margin-punching card on their smoking habits and views on the health-injuring effect of tobacco smoking, on the methods hitherto applied with regard to the antinicotine campaign, on their personal engagement in smokers' abstention cures as well as on their possible willingness to participate in the combating of nicotine abuse. Four hundred and seventy-six physicians replied in an evaluative way. We recorded clear differences between smokers and nonsmokers, as to the manner of replying. These differences permit the assumption that smoking physicians appear to be somewhat inhibited and prejudiced with regard to their readiness to recognize the health-injuring effect of smoking and to cooperate in the field of smokers' abstention cures.

71-0338. Thomas, C. B., Fargo, R., Enslein, K. **Personality Characteristics of Medical Students as Reflected by the Strong Vocational Interest Test With Special Reference to Smoking Habits.** *Johns Hopkins Medical Journal* 127(6):323-335, December 1970.

The Strong Vocational Interest Blank (SVIB) was administered to 383 Johns Hopkins medical students in seven consecutive classes graduating in 1958-1964 to determine whether personality differences measured in young adulthood would predict which subjects develop hypertension or coronary disease in later life. Various genetic, psycho-social and physiological characteristics were also recorded, smoking habits among them. The vocational interests of the medical students were found to generally resemble those of Strong's criterion group of physicians. In medical school, heavy smokers had significantly different SVIB scores from those of nonsmokers for a number of single occupational variables. A discriminant function analysis showed a highly significant difference between the heavy smoker and nonsmoker groups. The SVIB scores of light smokers resembled those of nonsmokers more closely than those of heavy smokers. When single SVIB variables were compared, light smokers shared some of the main occupational interests of the heavy smokers, but had distinctive differences as well. Pipe smokers were significantly different from nonsmokers in regard to another set of single occupational variables. When their current smoking habits were reported in 1968, less than a third of the original group of heavy smokers were found to have stopped smoking. Former students who had stopped smoking more closely resembled nonsmokers in their vocational interests while in medical school than did those who continued to smoke.

71-0339. Wakefield, J. **Advertizing and Smoking.** *International Journal of Health Education* 8(3):118-122, 1970.

This paper presents a number of facts about expenditure on the advertising of tobacco products and what changes there have been over the past six years in the United Kingdom. This is followed by some information on the trends in smoking behavior among men and women over the same period. The complex situation which it brings out leads the author to ponder on the many factors which affect health behavior and make it so difficult to evaluate health education attempts. (Auth. Abs.)

71-0340. Westling-Wikstrand, H., Monk, M. A., Thomas, C. B. **Some Characteristics Related to the Career Status of Women Physicians.** *Johns Hopkins Medical Journal* 127(5):213-286, November 1970.

Of 81 women who graduated from medical school between 1948 and 1958, 69 were in active practice in 1967. Over one-quarter had attained specialty certification; 21 percent held appointments as assistant professor or above. In general, the women had good grades in medical school (better than their male classmates). Nearly 78 percent of these graduates had married. Marital status and family size were closely related to career. Being married, especially at an early age, is associated with a less successful career, as is having an increasing number of children. The most successful women, the "professors" group, were more likely to be single, to be regular cigarette smokers and to have lower scores on "habits of nervous tension" than their colleagues. In these two latter respects they were similar to their male colleagues in medical school. The specialty of pediatrics contained the largest proportion of nonsmoking women, 66.7 percent, and very few regular smokers, 16.7 percent. In other specialty groups, about 42 percent of the physicians were regular smokers. For these women physicians, smoking was not significantly correlated with nervous tension. Almost half of the married women had physician-husbands. Those who married physicians had less conspicuous careers and had more children than the average, within each of the professional categories. The women who were daughters of managers and proprietors had the best grades and the most prominent careers. Daughters of physicians seemed to have low professional ambitions, but, on the other hand, were most likely to be in practice. It is suggested that part of the reason women medical graduates do not realize their full potential in later careers lies in the views and practices of society and medical institutions. (Auth. Abs. Mod.)

See also, 71-0197, 71-0314, 71-0349

TOBACCO ECONOMICS

71-0341. Swomley, J. A. **The Cigarette Epidemic.** *Connecticut Health Bulletin* 85(1):11-22, January 1971.

Included in this general review is an array of statistics on the effects of smoking, who smokes cigarettes, cigarette consumption, the cigarette tax and its effect on cigarette sales, and cigarettes and the economy. Cigarette advertising, efforts to control it and the broadcast and tobacco industries' reaction to control are discussed along with the antismoking efforts of health agencies on radio and TV and the increasing national effort to combat smoking. Antismoking activities in Connecticut are emphasized.

BILLS AND LEGISLATION

71-0342. Egsmose, A. T. **Prioriteringsproblemer og Tobaksrygning. [Priority Problems and Tobacco Smoking.]** *Ugeskrift for Laeger* 132(37):1748-1749, September 10, 1970, Danish.

Investment in the health sector, especially the hospital-services, has grown to such an extent that increased interest in prophylactic measures has now become a necessity. In this context tobacco smoking has been reviewed. It is known today that it has a definitely harmful effect. Measured in deaths, lost working days, sick days, and disablement, the cost to society is considerable. It would, therefore, be a rational move for our decision-makers to give a high priority to the control of this health hazard. It is suggested that 0.5 percent of the government tobacco duties, almost U.S. $1.5 million, should be released for a control program which has been roughly outlined. (Auth. Abs.)

71-0343. Roisman, A. Z. **Nonsmokers Have Rights, Too.** *Bulletin National Tuberculosis and Respiratory Disease Association* 57(4):10-13, April 1971.

The hypothesis that the so-called right to smoke is equal if not superior to the right to be free from smoke is examined in terms of Constitutional rights and the right to a clean and healthy environment. An attempt is made to explain how the tobacco industry, using massive advertising campaigns and persuasive lobbyists, has brought about public acceptance of the right to smoke. Consumer pressure groups are recommended as a means for nonsmokers to asssert their rights.

See also, 71-0235

SMOKING CESSATION METHODS

71-0344. Fredrickson, D. T. **The Primary Physician in Office Management of Smoking Problems.** *Chest* 59(4):414-417, April 1971.

Smoking is viewed as a habit and a habit as behavior learned through systematic training. Becoming an ex-smoker involves unlearning the smoking habit and replacing it with a newly learned habit, nonsmoking. Motivating the smoker to quit through personal relevance and how the physician can help the smoker hasten the process of deciding to stop smoking are discussed.

71-0345. Janis, I. L., Hoffman, D. **Facilitating Effects of Daily Contact Between Partners Who Make a Decision to Cut Down on Smoking.** *Journal of Personality and Social Psychology* 17(1):25-35, January 1971.

This field experiment was conducted in a smoking clinic with 30 adults who volunteered to attend five weekly meetings with a consultant. Pairs of subjects were assigned to one of three equivalent experimental groups: (a) *high-contact partners,* who were asked to phone each other daily; (b) *low-contact partners,* who spoke with each other only at clinic meetings; (c) *controls,* who had a different partner at each meeting. At the last clinic session, the high-contact partners showed more positive effects than the other two groups on measures indicating that they developed (a) more unfavorable attitudes toward smoking ($p < .01$), (b) more favorable attitudes toward the clinic ($p < .05$) and toward the partner ($p < .05$), and (c) fewer withdrawal symptoms of anxiety after cutting down on smoking ($p < .05$). Follow-up interviews indicated that during the subsequent year the high-contact partners continued to smoke fewer cigarettes ($p < .01$) than subjects in the other two groups, almost all of whom reverted to their former smoking habits. The high-contact partners reported, however, that they had discontinued contacting each other by 4 weeks after the final clinic session. Alternative explanatory hypotheses are assessed by taking account of supplementary observations, including a content analysis of the partners' conversations during meetings. The most plausible mediating factor appears to be the increase in interpersonal attraction produced by daily contact, which makes for increased valuation of the clinic group and internalization of the norms conveyed by the consultant leader. (Auth. Abs.)

See also, 71-0337

71-0346. Lichtenstein, E. **How to Quit Smoking.** *Psychology Today* 4(8):42-45, January 1971.

A satiation method to aid the habitual smoker to quit is described. The technique is based on aversive conditioning brought about by a combination of rapid smoking, at 6-second intervals, and smoke blown into the smoker's face from a machine. All but one of 58 hard-core smokers stopped smoking after treatment, and after six months, 34 of the 58 were still not smoking. Other types of cessation techniques are reviewed including overdosage, electric shock, behavior modification, positive social reinforcement, stimulus control, group therapy, drama, and gradual reduction vs. "cold turkey" methods.

71-0347. Luban-Plozza, B. **Nicotine et Hygiene de Vie. [Nicotine and a Healthful Life.]** *Medecine et Hygiene* 29(949):176-179, February 3, 1971, French.

Following some introductory remarks concerning the absolute and relative harmful effects of smoking as well as the psychological reasons for smoking at an early age, a distinction is made among the nicotine addicts, the pleasure smokers, and the habitual smokers. The detoxification methods distinguish a treatment without medication making use of will power and psychotherapy among other techniques. Medical therapy uses especially psychotropic drugs or products containing Lobelin. A questionnaire is of help in investigating motivational factors. (Auth. Abs. Mod.)

71-0348. Barrett, H. S. **Some Reminiscences Concerning the Contributions of the State Department of Health to the Smoking and Health Problem.** *Connecticut Health Bulletin* 85(1):5-10, January 1971.

A brief historical commentary on the policies, programs, committees, and activities of the State Department of Health and its concern with the smoking and health problem in Connecticut reviews the role a public health service plays in helping to identify, define, and warn against the health hazards of cigarette smoking.

71-0349. Marrone, R. L., Merksamer, M. A., Salzberg, P. M. **A Short Duration Group Treatment of Smoking Behavior by Stimulus Saturation.** *Behavior Research and Therapy* 8(4):347-352, November 1970.

The effectiveness of short-duration stimulus saturation of cigarette smoking was tested on 32 subjects who wanted to quit smoking. Subjects chain-smoked for either 20 hours (group E_1) or 10 hours (group E_2). Total abstinence was the main dependent measure. Both groups experienced relatively equal success on a short-term basis. Long-term abstinence was noted for group E_1 only. Sixty percent of the E_1 subjects were not smoking four months after treatment. (Auth. Abs. Mod.)

71-0350. Schulz, W., Seehofer, F. **Uber die Lange von Cigarettenstummeln in der Bundesrepublik Deutschland im Jahre 1968. [Length of Cigarette Butts in the Federal German Republic in 1968.]** *Beitrage zur Tabakforschung* 5(4):198-200, August 1970, German.

The length of the butts left by the smokers was ascertained from approximately 40,000 cigarette butts gathered in 1968 in the whole of the Federal Republic of Germany and West Berlin. In comparison with an examination made in 1959, it could be seen that the length of the butts of filter cigarettes increased by 8.5 mm (from 22.1 to 30.6 mm) and the length of the butts of cigarettes without filter by 6.3 mm (from 19.3 to 25.6 mm). (Auth. Abs.)

71-0351. Schurer, D. **A New Time-Regulating Mechanism for a Pipe-Smoking Machine.** *Beitrage zur Tabakforschung* 5(5):229-230, November 1970.

A pipe-smoking machine was constructed which simulates pipe-smoking. A photo-electric cell and a perforated endless belt were used for the time-regulation. The reproducibility of the puff and interval duration was fair; that of the crude and dry condensate of two types of tobacco smoked in this machine requires more investigation. (Auth. Abs.)

71-0352. Timm, J. **Einige Trendanalysen zum Problem des Cigarettenrauchens in der Bundesrepublik Deutschland fur die Jahre 1961–1969. [Several Trend Analyses on the Problem of Cigarette Smoking in the German Federal Republic for 1961–1969.]** *Beitrage zur Tabakforschung* 5(4):193-197, August 1970, German.

On the basis of numerous research results and data on the development of condensate contents of German cigarettes, their share of the market, the smoked length of cigarettes in laboratory tests as opposed to the average smoker, the per capita consumption of cigarettes in the Federal Republic of Germany and the trends of the smokers' share, an estimate has been prepared in the Federal Republic on the yearly per capita consumption of smoke condensates covering the years 1961-1969. The value for 1961 amounts to 40.2 g, whereas for the year 1969, 31.9 g have been obtained. This means that the consumption of cigarette condensates in the Federal Republic has decreased during the last years. At a nearly constant share of smokers it can be seen that the consumption of smoke condensates per smoker had decreased by about 20 percent during the years between 1961 and 1969, despite an increased cigarette consumption. (Auth. Abs.)

See also, **71-0341**

CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-0353. Ankier, S. I., Brittain, R. T., Jack, D. **Investigation of Central Cholinergic Mechanisms in the Conscious Mouse.** *British Journal of Pharmacology* 42(1):127-136, May 1971.

An investigation of central cholinoceptors in the mouse has been made by injecting cholinomimetic drugs into the cerebral ventricles and seeing how their effects were modified by prior administration of atropine-like substances and other drugs. Carbachol or oxotremorine injected in small doses intracerebroventricularly into conscious mice caused hypothermia, gross tremor and a variety of parasympathomimetic effects including lachrymation and salivation. Acetylcholine injected in this way was active only in much larger doses. Methacholine and pilocarpine also caused a variety of parasympathomimetic effects after intracerebroventricular injection but virtually no hypothermia or tremor. Nicotine injected intracerebroventricularly caused mild hypothermia, fine tremor but no parasympathomimetic effects. Atropine-like drugs, tricyclic antidepressants and amphetamine antagonized the hypothermia induced by intracerebroventricular carbachol or oxotremorine. The sites of action of the atropine-like drugs are in the brain; those of the tricyclic antidepressants and amphetamine are in the periphery probably on heat generating β-adrenoceptor mechanisms. It is concluded that the atropine sensitive cholinoceptors in the brain vary in their sensitivities to cholinomimetic drugs, other than acetylcholine, and may exist in isoreceptor forms. Peripheral atropine sensitive cholinoceptors may also exist in isoreceptor forms. (Auth. Abs.)

71-0354. Appleton, R. A., Enzell, C. R., Kimland, B. **Tobacco Chemistry. 3: Unsaturated Hydrocarbon Constituents of Greek Tobacco.** *Beitrage zur Tabakforschung* 5(6):266-274, December 1970.

Tobacco from Serres, Greece, has been studied with respect to the content of unsaturated hydrocarbons. The isolation of these constituents involved as a key step distillation with the aid of a new technique using carbon dioxide as carrier gas and total condensation of this and the distillate at liquid nitrogen temperature. In addition to the main constituent, neophytadiene, the unsaturated hydrocarbon fraction was shown to contain a series of aromatic compounds. These were examined by means of gas chromatography on capillary columns and also by gas chromatography in combination with mass spectrometry. Fractions were examined before and after elimination of smaller amounts of accompanying olefinic material with the aid of osmium tetroxide. The aromatic constituents were found to be alkylated benzene and naphthalene derivatives, of which many have been identified unambiguously. The vast majority of these have not previously been encountered in tobacco. Several have, however, been detected in smoke and the present results therefore show that these compounds are not necessarily formed solely in the pyrolysis process. (Auth. Abs.)

71-0355. Astrup, P., Kjeldsen, K., Wanstrup, J. **Effects of Carbon Monoxide Exposure on the Arterial Walls.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):294-300, October 5, 1970.

Published version of 70-0305.

71-0356. Astrup, P. **Intraerythrocytic 2,3-Diphosphoglycerate and Carbon Monoxide Exposure.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):252-254, October 5, 1970.

A review of studies on the 2,3-diphosphoglycerate (2,3–DPG) content of red blood cells and its relation to CO exposure shows that exposure to CO results in decreased 2,3–DPG content, in increased hemoglobin affinity to oxygen, and in displacement of the oxyhemoglobin dissociation curve to the left. Hypoxia increases 2,3–DPG content, decreases hemoglobin affinity to oxygen, and displaces the oxyhemoglobin dissociation curve to the right. Exposure to oxygen inhalations or to high atmospheric pressure in a high pressure chamber has the same effect as exposure to CO. Small changes in blood pH can change 2,3–DPG concentration.

71-0357. Badakov, S., Ivancev, V. **Recherches Experimentales sur le Microclimat des Chambres de Fermentation du Tabac. I. Changements Morphologiques Dans les Organes Internes et le Systeme Nerveux des Lapins. [Experimental Research on the Microclimate of Tobacco Fermentation Chambers. I. Morphological Changes in the Internal Organs and Nervous System of Rabbits.]** *Folia Medica* (Plovdiv) 12(1):25-31, 1969, French.

Morphologic changes originating in the internal organs and the nervous systems of rabbits exposed to the action of toxic substances extracted from the fermentation of tobacco were studied. The most significant dystrophic and hemodynamic changes were observed in animals during the acute experiment and in the later phases of the subacute experiment. Lesions of the central nervous system were found, particularly of the trunk region, cerebral cortex and the anterior layer of the spinal cord. Peripheral nerves suffered various dystrophic lesions. The myelinic fibers were more seriously affected. In all cases, important changes were observed in the axial sheaths of the optic nerves. These morphologic changes resulted from the complex action of all the toxic substances in which methyl alcohol and nicotine probably play a primary role.

71-0358. Beard, R. R., Grandstaff. N. **Carbon Monoxide Exposure and Cerebral Function.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals* *of the New York Academy of Sciences* 174(Art. 1):385-395, October 5, 1970.

Various studies on the cerebral effects of small doses of carbon monoxide (CO) from air pollution and cigarette smoking as well as under laboratory conditions are reviewed. CO has been shown to significantly degrade auditory signal discrimination, brightness-difference discrimination, time estimation and visual acuity. No demonstrable effects of CO on driving ability, critical flicker fusion frequency, oxygen transport or enzyme systems have been reported.

71-0359. Brown, D. A., Halliwell, J. V., Scholfield, C. N. **Uptake of Nicotine and Extracellular Space Markers by Isolated Rat Ganglia in Relation to Receptor Activation.** *British Journal of Pharmacology* 42(1):100-113, May 1971.

Results of an experiment using isolated rat ganglia incubated in nicotine solution indicate: nicotine is concentrated in ganglion cells to a level far exceeding that in the extracellular fluid; the concentration in sympathetic ganglion cells exceeded that in nodose ganglion cells; and this difference reflects in part an increased uptake of nicotine into sympathetic ganglion cells during nicotine-induced depolarization. There exists a relatively rapid concentrating process for nicotine in cells of the sympathetic ganglion, resulting in a substantial intracellular-extracellular concentration gradient. This uptake process has essentially two components: (1) a component observed in the absence of depolarization by nicotine which leads to a mean intracellular concentration about six times that in the extracellular fluid, and which may be termed the 'resting uptake'; and (2) an additional uptake linked in some manner with the effect of nicotine upon the receptors, serving to increase the overall intracellular concentration by a further 25 percent (and perhaps by considerably more in the responsive cells themselves), which may be designated 'activation uptake'.

71-0360. Bruni, A. **Effect of Tobacco Smoke Poisoning on Phagocytosis.** Complete English translation of "Influenza dell'Avvelenamento da Fumo di Tabacco sulla Fagocitosi", *Sperimentale* 85:523-543, 1931.

The defensive mechanism, phagocytosis, was studied in medium-size rabbits subjected to tobacco-smoke poisoning. The effects of both acute poisoning, where 4 or 5 cigarettes were smoked one after another, and chronic poisoning, where one cigarette was smoked daily over a period varying from 15 to 49 days, were investigated. Results showed that under both acute and chronic poisoning phagocytosis was considerably reduced; that the content of substances with opsonic power in the blood serum did not undergo modification; and that phagocytic activity was adversely affected. In conclusion, the reduction of phagocytosis was linked to the immediate effect of tobacco smoke on the leukocytes.

71-0361. Bush, L. **Principal Alipathic Secondary Amines of Burley Tobacco.** *Beitrage zur Tabakforschung* 5(6):275-278, December 1970.

Quantity and distribution of the principal aliphatic secondary amines--dimethylamine, methylethylamine, diethylamine, and methylpropylamine--varied within plant tissue and among *Nicotinana* spp. In burley tobacco the stem tissue had the highest content of these amines and the leaf midrib the lowest. Leaf lamina, roots and seed were intermediate in amine content. Among *Nicotiana* spp. there was considerable difference in total amine content as well as among the ratios of the amine fractions measured. Amine content of tissue was positively correlated with nitrogen content of tissue and was altered by the drying process of tissue prior to analysis. The amines were not present as free amines or salts but were detected only following steam distillation from a basic medium. (Auth. Abs.)

71-0362. Cano, J.-P., Catalin, J., Badre, R., Dumas, C., Viala, A., Guillerme, R. **Determination de la Nicotine par Chromatographie en Phase Gazeuse. II. Applications. [Determination of Nicotine by Gas-Phase Chromatography. II. Applications.** *Annales Pharmaceutiques Francaises* 28(11):633-640, November 1970. French.

Nicotine was measured by gas-phase chromatography in the air and in the urine of smokers and nonsmokers in an enclosed but regenerated atmosphere in closed circuit and supplied with oxygen. The atmospheric concentration of the alkaloid varied from 15 to 35 micrograms/m^3. In smokers, urinary elimination (0.35 to 1.60 mg/24 h) depended on the subject himself, the nature of the tobacco and the presence or absence of a filter on the cigarette consumed. It appeared that the regeneration of the air had a certain influence in the absorption of the alkaloid. In nonsmokers exposed to the smoking atmosphere, the urinary excretion of nicotine was from 22 to 70 micrograms/24 h. These results show that the quantity of nicotine absorbed by nonsmokers is a function of the amount of the alkaloid in the air and point out the importance of having air purification in smoking environments.

71-0363. Casarett, L. J. **Toxicology: The Respiratory Tract.** *Annual Review of Pharmacology* 11:425-446, 1971.

A detailed review of the research in pulmonary toxicology is presented. Highlighted in this review are effects of the pulmonary toxicant dose on human health, and the development of pulmonary dysfunction and progressive pathologic change from inhaled toxicants, particularly the contribution of smoking to emphysema. Emphasis is given to the influence of pollutant gases on susceptibility to infection and the functional potency of the alveolar macrophage, particularly carbon monoxide on alveolar cells, and to the noncellular components of lung tissues. Also discussed are early lung changes, the deposition and clearance of particles, the alveolar response, and the mixtures of toxicants, especially particulate, in the atmosphere.

71-0364. Chan, E. W., Ball, J. K. **Polycyclic Aromatic Hydrocarbons Covalent Binding to DNA and Effects on Template Function.** *Biochimica et Biophysica Acta* 238(1):46-49, April 29, 1971.

Exposure of solutions of DNA containing intercalated molecules of benz(*a*)pyrene or pyrene to γ-irradiation resulted in very extensive covalent binding of these hydrocarbons to DNA. The extent of binding for benz(*a*)pyrene was 1 molecule for every 100 DNA nucleotides and for pyrene was 1:270 DNA nucleotides. It was also found that *in vitro* transcription was inhibited when DNA containing covalently bound benz(*a*)pyrene was used as template for *Escherichia coli* DNA dependent RNA polymerase. (Auth. Abs.)

71-0365. Chopra, N. M., Domanski, J. J., Osborne, N. B. **Systematic Studies on the Breakdown of *p,p'*-DDT in Tobacco Smokes.** *Beitrage zur Tabakforschung* 5(4):167-174, August 1970.

The report deals with the isolation and identification of the degradation products of the pyrolysis of DDT in a nitrogen atmosphere and the pyrolytic degradation of DDT intimately mixed with tobacco. The formation of TDE, bis(*p*-chlorophenyl)methane, methyl chloride and dichlorostilbenes indicates that hydrogenation is one of the most important reactions taking place in the smoking of tobacco, presumably in the burning zone. The formation of dichlorocarbene and trichloromethyl radicals suggests that these are some of the primary alkylating agents in tobacco smoke and that methyl chloride is really a secondary alkylating agent.

71-0366. Coburn, R. F. (Editor) **Biological Effects of Carbon Monoxide.** *Annals of the New York Academy of Sciences* 174(Art. 1):1-430, October 5, 1970.

These conference papers point out that although the world CO production is increasing and now totals approximately 175 million tons per year, "background" CO concentrations (in the troposphere and in air above remote areas in the Pacific Ocean) are apparently not increasing. Ocean CO concentrations seem to be much greater than expected from consideration of CO solubility and air CO concentrations and it is now thought that the oceans may be the largest natural source of CO. Motor vehicle exhaust contributes about 70 percent of CO produced from all sources. Measurements of blood carboxyhemoglobin (COHb) percent saturation show that significant numbers of people have blood COHb levels which exceed levels that have been associated with CO toxicity in acute experiments on man and animals. There is convincing evidence that acute absorption of CO giving COHb levels as low as 3 to 5 percent saturation may cause a subtle effect on the CNS. The negative findings reported by others who have studied effects of an equivalent CO exposure on mental performance are apparently related to differences in the testing situation. Two studies support the concept that CO toxicity is due to binding with hemoglobin and a resultant decrease in oxygen tension in peripheral capillaries and tissues. However, other studies offer evidence that CO binding to nonhemoglobin hemoprotein is a mechanism of CO toxicity in man. Both man and animals can adapt to CO effects through such mechanisms as erythropoiesis. A 2,3-diphosphoglycerate-mediated shift in the oxyhemoglobin dissociation curve appears not to be a major mechanism of adaptation to CO hypoxia. Endogenous CO production causes an increase in the body CO stores sufficient to elevate blood COHb to levels of about 4 percent saturation in patients with rapid rates of hemoglobin turnover. The same hemoproteins which bind body CO appear to be precursors of endogenous CO.

71-0367. Debas, H. T., Cohen, M. M., Holubitsky, I. B., Harrison, R. C. **Effect of Cigarette Smoking on Human Gastric Secretory Responses.** *Gut* 12(2):93-96, February 1971.

The effect of smoking three cigarettes over a one-hour period on the pentagastrin-stimulated submaximal plateau of acid and pepsin secretion was observed in 12 healthy human volunteers comprising men and women and smokers and nonsmokers. No significant overall change in secretion was observed. In one subject, however, acid secretion was significantly inhibited ($P < 0.01$) and in one individual significant late stimulation ($P < 0.01$) of both acid and pepsin was observed. (Auth. Abs.)

71-0368. Dinman, B. D., Eaton, J. W., Brewer, G. J. **Effects of Carbon Monoxide on DPG Concentrations in the Erythrocyte.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):246-251, October 5, 1970.

Both humans and rats were exposed to varying doses of carbon monoxide (CO) to determine its effects on 2,3-diphosphoglycerate (DPG) concentrations in the erythrocyte. Results showed that changes in DPG levels were inversely related to peak carboxyhemoglobin concentrations. Possible mechanisms which could account for the increased DPG levels found in both humans and rats exposed to the lower CO doses are discussed.

71-0369. Dogon, I. L., Amdur, B. H., Bell, K. **Observations on the Diurnal Variation of Some Inorganic Constituents of Human Parotid Saliva in Smokers and Non-Smokers.** *Archives of Oral Biology* 16(1):95-105, January 1971.

Stimulated parotid secretion (5-ml volumes) was collected by means of a modified Carlson-Crittenden device from 25 healthy subjects (18–45 yr of age) at 4 hr intervals over a 24-hr period. By uniform stimulation, the flow rates of each subject were kept within 0.2 ml/min/gland for the 6 collections ranging from 0.42–0.56 ml/min/gland. The subjects were divided into 13 smokers and 12 nonsmokers. Ca, Mg, Na, K, SCN^- and Cl were determined on each sample. The thiocyanate concentrations were significantly higher in smokers than nonsmokers ($p < 0.001$), decreasing in both groups during the sleeping hours ($p = 0.02$). Chloride concentrations were similar in smokers and nonsmokers, but increased during sleeping hours ($p = 0.05$). Calcium was markedly lower in smokers ($p = 0.001$) but showed no diurnal variation. Potassium increased in the smoking compared to the nonsmoking group, but it also showed no diurnal variation. Magnesium showed no statistically significant change with smoking status or time. Sodium concentrations were not significantly affected by smoking status, but showed a tendency to increase during sleep. The nicotine action explains the difference between smokers' and nonsmokers' potassium salivary levels. The diurnal patterns are probably related to metabolic variation. (Auth. Abs. Mod.)

71-0370. Donzelli, F. **Effect of Tobacco Smoke Poisoning on Agglutinins.** Complete English translation of

"Influenza sulle Agglutinine dell'Avvelenamento da Fumo di Tabacco", *Giornale di Batteriologia e Immunologia* 11:1012-1018, 1933.

The experiments showed that acute poisoning from tobacco smoke in immunized animals results in a lowering of the agglutinating titer of the blood serum. This lowering was only transient and within 24 to 48 hours the agglutinating power returned to its original titer. The maximum reduction was usually reached within 6 hours after the poisoning, and appeared most markedly in animals which were chronically poisoned with tobacco smoke. During immunization, the animals poisoned with tobacco smoke produced the agglutinating antitoxins with remarkable delay, and at the end of the immunization period, the titer of the agglutinating power of their serum was decidedly lower than that of the controls.

71-0371. DuBois, A. B. **Establishment of "Threshold" CO Exposure Levels.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):425-428, October 5, 1970.

This paper discusses carbon monoxide (CO) levels already established for special groups for limited duration, how CO levels to be proposed for continuous exposure of the population at large must differ from those presently existing for exposure of special groups, whether a threshold exists for CO exposure, and steps remaining to be taken toward establishing air quality standards for CO.

71-0372. Elmenhorst, H., Frahm, B. **Fluoreszenzmessungen an Zigarettenrauchkondensaten. [Measurement of Fluorescence in Cigarette Smoke Condensate.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 72-76, German.

The total fluorescence of cigarette smoke condensate from 13 different cigarettes was investigated to study the possible correlation between the total fluorescence and the biological activity of the different smoke condensates. No unequivocal correlation could be found. Miller and Leonard found that the reduction of biological activity in smoke condensate, due to the addition of sodium nitrate to cigarette tobacco, corresponded to a reduction of fluorescence in condensates. The results show that the correlation found by Miller and Leonard cannot be generalized. (Auth. Abs. Mod.)

71-0373. Elmenhorst, H., Harke, H.-P. **Uber die alkylierende Wirkung des Zigarettenrauches. [The Alkylating Effect of Cigarette Smoke.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 77-84, German.

The method for the quantitative estimation of the alkylating activity of cigarette smoke condensate as used by Stedman and Miller was tested. The alkylating activity of cigarette smoke condensate, some fractions of smoke condensate, and the so-called vapor phase condensate by conversion through 4-(4-nitrobenzyl)pyridine were studied. The quantitative evaluation of the values obtained is only possible with all reserve as the method contains a large number of sources of errors. No correlation between the alkylating activity and biological activity (determined by mouse skin painting) of the different smoke condensates and fractions of smoke condensate could be found. It appeared remarkable that an alkylating activity could be found in the vapor phase condensate of smoke. (Auth. Abs. Mod.)

71-0374. Elmenhorst, H., Holle, W. **Zigarettenrauchkondensate fur Tierversuche. 1. Herstellung und routinemassige Kontrolle. [Cigarette Smoke Condensates for Animal Tests. 1. Preparation and Routine Control.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 57-60, German.

A method for the preparation of cigarette smoke condensate for animal experiments is described. Cigarette smoke is precipitated in cold traps at −80° C. The condensate is dissolved in acetone and the obtained solution is evaporated under reduced pressure. The residue is dissolved in acetone according to the wanted concentration of condensate solution and can be applied to the skin of mice by dropper. Condensate solutions prepared by the described method contain a substantial portion of the semi-volatiles of cigarette smoke. (Auth. Abs.)

71-0375. Elmenhorst, H., Harke, H.-P. **Zigarettenrauchkondensate fur Tierversuche. 2. Ein neues, schonendes Herstellungsverfahren, bei dem fluchtige Inhaltsstoffe des Rauches in der Losung erhalten bleiben. [Cigarette Smoke Condensates for Animal Tests. 2. A New Practical Method of Preparation to Preserve the Volatile Components of the Smoke in the Solution.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 61-65, German.

A method of preparing solutions of cigarette smoke condensate is described. The method allows the preservation of volatile components of smoke in the solution. The smoke is precipitated in a cold trap at −80° C and is dissolved with acetone at low temperatures. The maximum contentration of the solutions is between 40 and 50 percent of dry condensate. The new procedure is of advantage compared with the previously employed method of evaporating and resolving the smoke condensate. Changes in the composition of condensates, occurring possibly by high temperatures during evaporation, are prevented. Volatile substances distilling over together with solvents and water vapors are preserved. Secondary reactions by increased temperature during distillation, the consequences of which cannot be approximately estimated yet, are likely to be prevented by the new method. (Auth. Abs.)

71-0376. Freour, P., Coudray, P., Fontan, M.E.C. **Approche Pour une Lutte Contre l'Intoxication Tabagique. Donnees Epidemiologiques sur un Groupe d'Adultes des Deux Sexes. [An Approach for the Fight Against Tobacco Poisoning. Epidemiologic Data on a Group of Adults of Both Sexes.]** *Bulletin de l'Academie*

Nationale de Medecine 154(24):633-649, October 13, 1970, French.

This study was undertaken to determine the importance of the tobacco consumption phenomena in a large city. In Bordeaux, France, the smoking habits of 2490 adults (30-70 years old) were investigated from 1963 to 1967. Results indicated that 1099 men (83.2 percent) were smokers of which 90.3 percent smoked only cigarettes and 59.4 percent inhaled. When compared with other countries, French smokers were average with only 30 percent smoking more than a pack a day. However, the total quantity of cigarettes smoked by each subject during his lifetime was relatively important since more than 40 percent of the smokers smoked more than 150,000 cigarettes which is the equivalent of 20 cigarettes a day for a period of 20 to 40 years. Forty-five percent of the smokers indulged for more than 30 years. Although 80 percent started smoking before 21 years of age, the study of smoking relative to age showed statistically that tobacco consumption was quite light in the beginning and again after 60 years of age. Cessation occurred in 290 (26.9 percent) at varying ages after a variable period of consumption. Finally, military service intervened in 60 percent of the cases either as a starting factor or as an aggravating factor.

71-0377. Goldsmith, J. R. **Contribution of Motor Vehicle Exhaust, Industry, and Cigarette Smoking to Community Carbon Monoxide Exposures.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):122-134, October 5, 1970.

Exposure to carbon monoxide (CO) in cigarette smoking, in connection with certain occupations, in households, particularly from heating and cooking, and in the general community where motor vehicle exhaust is the primary source is examined with respect to the proportion of people affected, the magnitude of short- and long-term exposure in relation to the possibility of illness, and the time-course of exposure in relation to the possible hazards. Depending on age and sex, cigarette smoking affects from 40 to 60 percent of all adults. CO exposure in cigarette smoke can produce up to 15 percent carboxyhemoglobin (COHb). The time course is inherently intermittent. Within smoking categories there is an apparent decrease in COHb with age. Pipe and cigar smokers in the U.S. have much less exposure to CO than cigarette smokers. The usual effect of occupational exposure to CO causes increases of less than 10 percent COHb. The usual pattern of work permits a substantial recovery if the work is intermittent. At least 750,000 people probably have occasional occupational exposure to CO. In household exposure to CO, the subject is usally unaware of the risk, the exposure can range from less than 2 percent to an amount sufficient to cause death, the exposure is often over a number of hours, and the exposure is inadequately evaluated. Tens of millions of people are exposed to motor vehicle exhaust resulting in COHb levels of less than 2 percent, but exceptional circumstances could lead to acute illness. The time course is unpredictable and largely depends on meteorological conditions, but exposures are generally elevated over periods of several hours sufficient enough to produce an appreciable COHb rise.

71-0378. Guertzenstein, P. G. **Stimulation by Nicotine of a Vasodilator Area on the Floor of the Fourth Ventricle.** *Journal of Physiology* 214(1):5P-6P, April 1971.

Nicotine, in doses of 5 to 20 micrograms, applied to the vasodilater area on the floor of the fourth ventricle in anesthetized cats produced a fall in arterial blood pressure. The response was not greatly augmented during occlusion of the common carotids, was not abolished by intravenous atropine, and was obtained only when the nicotine was applied on to or just below the surface of the floor of the ventricle. Results showed that the nicotine acted on the nerve cells and, therefore, suggested a relay station in the depressor reflex arc of the afferent fibers of the vagus and or sinus nerves near the obex close to the surface of the fourth ventricle.

71-0379. Hanks, T. G. **Human Performance of a Psychomotor Test as a Function of Exposure to Carbon Monoxide.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):421-424, October 5, 1970.

Psychomotor control function and carbon monoxide (CO) were investigated under conditions of human exposure to low levels of CO. Nonsmoking, healthy young male college students were exposed to levels of 0, 25, 50, 75 and 100 ppm of CO on each of two series of runs. Breath samples were measured for CO content before and at half-hour intervals for 4½ hours during exposure, immediately following psychomotor testing. No effect on performance of the psychomotor control was found attributable to CO exposure.

71-0380. Harke, H.-P., Schuller, D., Drews, C.-J. **Zigarettenrauchkondensate fur Tierversuche. 3. Untersuchungen der flunchtigen Inhaltsstoffe der Rauchkondensatlosungen. [Cigarette Smoke Condensate for Animal Tests. 3. Investigations of the Volatile Components of Solutions of Smoke Condensates.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 66-71, German.

Investigations by gas chromatography and mass spectrometry reveal that tobacco smoke solutions, used for biological experiments, contain considerable parts of the volatile components of smoke condensate if the procedure of evaporation was avoided during preparation. These substances are almost completely lost if so-called dry condensate is used for the preparation of ths solutions. (Auth. Abs.)

71-0381. Haynes, J. L., Glauser, S. C. **Comments on Glauser Et Al's Article. (Letter)** *Archives of Environmental Health* 22(3):409. March 1971.

A study by Glauser *et al* entitled "Metabolic Changes Associated With the Cessation of Cigarette Smoking" is criticized for not showing a definitive association between the onset of statistically significant metabolic changes because of the lack of dietary controls. Many of the metabolic changes may have been affected by abrupt changes in dietary habits which often accompany cessation of smoking. Glauser replys that he had only intended his study to determine whether metabolic changes occurred upon cessation of smoking and that it seems unlikely that the observed changes would all be due simply to a change in dietary habits.

71-0382. Henderson, E. G., Hancock, J. C. **Nicotine-Induced Depolarization and Stimulation of Potassium Efflux in Striated Muscle.** *Journal of Pharmacology and Experimental Therapeutics* 177(2):377-388, May 1971.

The influence of nicotine on potassium (^{42}K) exchange in denervated frog sartorius and rat extensor digitorum longus muscles was examined. Nicotine (0.005-0.2 mM) did not alter the uptake of ^{42}K in any of the muscles tested. Efflux was significantly increased during the first one to five minutes of nicotine exposure and returned to normal monotonically within an hour in both types of denervated muscle as well as the innervated frog sartorius muscle. After removal of nicotine, there was a long period (>1.0 hour) during which ^{42}K efflux was decreased 20 to 50 percent below control values. The time course of ^{42}K efflux stimulation paralleled the time course of muscle cell membrane deplorization. Both the nicotine-induced depolarization and stimulation of ^{42}K efflux were blocked by prior administration of *d*-tubocurarine and, therefore, were probably initiated by an interaction of nicotine with chemo-sensitive sites on the muscle cells. The decreased rate of ^{42}K efflux after nicotine removal was not blocked when *d*-tubocurarine was added immediately after exposure to nicotine. Conduction in sartorius muscle cells was not blocked by low concentrations of nicotine (<0.06 mM) and action potentials recorded during the peak of depolarization were followed by a "late positive afterpotential" of long duration (>150 msec). The magnitude of the late positive afterpotential was increased by reducing the potassium concentration of the bathing medium. (Auth. Abs.)

71-0383. Hengy, H., Thirion, J. **The Determination of Malathion Residues in Tobacco and Tobacco Smoke Condensate.** *Beitrage zur Tabakforschung* 5(4), 175-178, August 1970.

A method was developed to determine Malathion in tobacco and in smoke condensate at levels of 0.05 ppm and above. A study on the Malathion content of leaf tobacco, cigarette tobacco, and the transfer rate from cigarettes into the main-stream smoke was made. The analysis revealed that the air-cured tobacco contained 0.1 ppm of the pesticide, while the flue-cured samples and cigarettes contained less than 0.05 ppm. The transfer studies indicated that approximately 91 to 92 percent of Malathion is lost during the smoking of cigarettes. (Auth. Abs.)

71-0384. Hexter, A. C., Goldsmith, J. R. **Carbon Monoxide: Association of Community Air Pollution With Mortality.** *Science* 172(3980):265-267, April 16, 1971.

Regression analysis of daily mortality in Los Angeles County shows that there is a significant association between community carbon monoxide concentrations and mortality. Cyclic variation and maximum temperature were the main contributors. No association was demonstrated between oxidant and mortality. (Auth. Abs.)

71-0385. Hoffmann, D., Mazzola, V. **Chemical Studies on Tobacco Smoke. XI. Dibenzofurans in Cigarette Smoke.** *Beitrage zur Tabakforschung* 5(4):183-188, August 1970.

A method was developed for the isolation of dibenzofuran (DBF) and its four methyl derivatives from cigarette smoke. The mainstream smoke of an 85-mm U.S. non-filter cigarette contained 106 ng of dibenzofuran, 40 ng of 1-methyldibenzofuran, 100 ng of 2- and 3-methyl dibenzofurans, and 52 ng of 4-methyldibenzofuran. The identification of DBF and its four methyl derivatives in cigarette smoke represents their first isolation from a respiratory environment.

71-0386. Holland, R.A.B. **Reaction Rates of Carbon Monoxide and Hemoglobin.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):154-171, October 5, 1970.

Equations are given for carbon monoxide's reactions with reduced hemoglobin, for its replacement of oxygen from oxyhemoglobin, and for its dissociation from carboxyhemoglobin. The relationship of the kinetic constants to the equilibrium conditions is discussed. Values are given for the rate constants for the various reactions of carbon monoxide with hemoglobin in a number of mammalian species, and new figures for the velocity constant of the dissociation of carbon monoxide from saturated hemoglobin are presented. The question of whether hemoglobin is functionally a tetramer or a dimer is briefly discussed. (Auth. Abs. Mod.)

71-0387. Jenkins, R. W. (Jr.), Newman, R. H., Carpenter, R. D., Osdene, T. S. **Cigarette Smoke Formation Studies. I. Distribution and Mainstream Products From Added ^{14}C-Dotriacontane-16,17.** *Beitrage zur Tabakforschung* 5(6):295-298, December 1970.

The distribution of ^{14}C-dotriacontane-16,17 and its combustion and pyrolytic products in cigarette smoke is described. Twenty-one percent of the activity is found in the mainstream smoke, 49 percent is found in the sidestream smoke, and 30 percent is found in the butt. Of the mainstream activity, 95 percent is in unchanged dotriacontane. The transfer of ^{14}C-dotriacontane to mainstream smoke is linear throughout the smoking of the cigarette, as shown by puff-by-puff data. Hypotheses to explain the results are presented. (Auth. Abs.)

71-0388. Jenkins, R. W. (Jr.), Newman, R. H., Chavis, M. K. **Cigarette Smoke Formation Studies. II. Smoke Distribution and Mainstream Pyrolytic Composition of Added ^{14}C-Menthol (U).** *Beitrage zur Tabakforschung* 5(6):299-301, December 1970.

The distribution of ^{14}C-menthol (U) and its combustion and pyrolytic products in cigarette smoke is described. The mainstream smoke contains 28.9 percent of the total activity with 44.3 percent in the sidestream smoke and 26.9 percent in the butt. The major

^{14}C-menthol smoke product in the mainstream smoke is unchanged menthol (98.9 percent). A puff-by-puff plot of menthol delivery is presented. The results obtained are explained hypothetically. (Auth. Abs.)

71-0389. Keeri-Szanto, M., Pomeroy, J. R. **Atmospheric Pollution and Pentazocine Metabolism.** *Lancet* 1(7706):947-949, May 8, 1971.

Study of the use of pentazocine for the supplementation of nitrous-oxide relaxant anesthesia in forty-one patients revealed that a significant correlation exists between high drug requirements and urban living as well as smoking. The excess drug requirement resided in the need for higher maintenance doses rather than in different priming doses for the subgroups. Changes in the rate of pentazocine disposal have been tentatively linked with ambient or self-induced atmospheric pollution, and it is suggested that similar differences are likely to occur with other drugs and in other therapeutic settings. (Auth. Abs.)

71-0390. Lawther, P. J., Commins, B. T. **Cigarette Smoking and Exposure to Carbon Monoxide.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):135-147, October 5, 1970.

A brief review is made of efforts to assess the relative contributions of air pollution and cigarette smoking to blood carboxyhemoglobin (COHb) levels. Results of CO sampling of London air showed consistent CO concentrations over an 18-month period which increased with time during the working day, reaching a peak around 6 pm, and which were in rough agreement with those reported for other large cities. Field surveys of COHb levels in both smokers and nonsmokers under various conditions of exposure to city pollution showed that smoking had a greater effect on COHb levels than street pollution. A study demonstrating that CO could be lost from the blood in smokers and in subjects experimentally gassed with CO despite exposure to traffic is briefly described.

71-0391. Longo, L. D. **Carbon Monoxide in the Pregnant Mother and Fetus and Its Exchange Across the Placenta.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):313-341, October 5, 1970.

The carboxyhemoglobin concentration in the blood of normal nonsmoking pregnant women $(COHb)_M$ is slightly increased over that of nonpregnant women. The steady state $(COHb)_M$ is a function not only of the endogenous CO production of the mother, the concentration of CO in inspired air, the alveolar ventilation and the pulmonary CO diffusing capacity, but also of the endogenous CO production of the fetus and the rate of CO exchange across the placenta. Endogenous production of CO is about 0.92 (± 0.11) ml/hr during pregnancy, as compared with 0.62 (± 0.06) ml/hr during the progestational phase of the menstrual cycle and 0.32 (± 0.04) ml/hr during the estrogenic phase. The COHb in human fetal blood $(COHb)_F$ is also a function of the above factors. $(COHb)_F/(COHb)_M$ is dependent upon the relative affinities of maternal and fetal blood for O_2 and the relative affinities of both bloods for CO as compared with O_2. During the steady state, $(COHb)_F/(COHb)_M$ is about 1.1 in humans and about 2.2 in sheep, dogs and rabbits. The placental exchange of CO is limited by diffusion, and the exchange rate is useful in quantitating placental respiratory function. The placental CO diffusing capacity is about 0.54 ml/ (min X mm Hg X kg fetal wt) for sheep and dogs. The half time for placental exchange is about two hours. About 60 percent of the resistance to diffusion is by the placental membrane, whereas about 20 percent of the resistance is due to the maternal and fetal intracellular chemical reaction rates. In the reported cases of carbon monoxide poisoning, $(COHb)_F$ was a function of $(COHb)_M$ and the duration of placental exchange of CO. Among the infants surviving maternal CO poisoning, all but one showed either neurological or pathological evidence of brain damage. Smoking during pregnancy results in average levels of $(COHb)_M$ of 2.0–8.3 percent. Mean $(COHb)_F$ varies from 2.4–7.6 percent. Maternal smoking has been reported to be associated with decreased infant weight, increased number of abortions, stillbirths, and deaths during the neonatal and postneonatal periods. Although these may result from excessive exposure of the fetus to CO, they may also result from decreased maternal food intake, effect of nicotine or other factors in tobacco smoke on the uteroplacental circulation or fetus, or some as yet unrecognized factor in smoking or in the mother who smokes. Animal studies suggest that CO per se is not the sole etiologic agent causing these effects. Some theoretical considerations of the effects of COHb on fetal oxygenation are presented. Elevated COHb is associated with: a shift to the left of the oxyhemoglobin saturation curve with a decrease in P_{50}; the lowering of P_{O_2} in the venous blood draining fetal tissues, and an increased ratio of carboxymyoglobin to COHb in myocardium and skeletal muscle. Finally, it is not possible at present to separate the effects of CO per se from hypoxia on the fetus. There is ample evidence that the decreased availability of O_2 resulting from elevations of COHb is probably injurious to fetal tissues. To what extent CO per se is harmful remains to be determined. (Auth. Abs. Mod.)

71-0392. Lunn, J. N. **Smoking.** *Midwives Chronicle* 84:59, February 1971.

Experiments in which cigarettes and pipes were artificially smoked in various concentrations of trichloroethylene showed no breakdown into phosgene. Therefore, smoking prohibitions for women receiving trichloroethylene analgesia for delivery for 24 hours following delivery are not justified.

71-0393. Markiewicz, K. **Bierni Palacze. O Szkodliwosci Biernie Wdychanego Dymu z Papierosow Palonych Przez Innych. [Passive Smoking. Harmfulness of Passive Inhalation of Smoke From Cigarettes Smoked by Others.]** *Polski Tygodnik Lekarski* 25(52):2041-2042, December 28, 1970, Polish.

The deleterious effect of the smoker on passive smokers is briefly discussed. The nonsmoker in the presence of cigarette smokers, especially in closed spaces or those that are not too well ventilated, is forced to inhale all kinds of compounds and materials. The cigarette ejects particles between 0.2 and 2 microns in size which are inhaled. Inside the cigarette, temperatures of 700° to 1050°C are reached and under insufficient admittance of air, carbon monoxide is created. This is easily ascertained by a determination of the carboxyhemoglobin in the blood of the nonsmoker. The smoke from 20 cigarettes, either smoked by one person consecutively or by several persons simultaneously creates 300 to 500 mg nicotine in a closed space. This is 6 to 10 times the lethal dose. Most of the nicotine is burned, but the air in a closed space after a period of occupancy by smokers contains between 3 and 5.3 mg nicotine/m^3. The effect of the smoker upon the nonsmoker becomes especially bad in restaurants, as there the nonsmoker flushes down the compounds into the intestinal tract with the saliva.

71-0394. Martin, J. C., Becker, R. F. **The Effects of Nicotine Administration *In Utero* Upon Activity in the Rat.** *Psychonomic Science* 19(1):59-60, 1970.

Holtzman male rat offspring whose mothers were injected twice daily throughout gestation with 3.0 mg/kg nicotine differed little from saline-injected control offspring on activity measures in the wheel. Offspring whose mothers were injected with the same dose of nicotine throughout gestation and the nursing period and offspring whose mothers received a four percent hypoxic episode throughout gestation were significantly more active than the control saline group. Differences were more extreme during the second week of testing than during the first. (Auth. Abs.)

71-0395. McFarland, R. A. **The Effects of Exposure to Small Quantities of Carbon Monoxide on Vision.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):301-312, October 5, 1970.

Results of experiments on the effects of small amounts of CO on visual perception are reviewed and related to the effects of age and altitude on vision. The visual functions tested were visual acuity at low levels of illumination, dark adaptation, differential brightness sensitivity, and critical flicker fusion. Results show that visual perception is impeded with increased altitude (i.e., decreasing amounts of 0_2 inhaled), age, and increased amounts of carboxyhemoglobin in the blood. It also showed that CO aggravated the effects of altitude and that the detrimental effects of CO on visual function lags behind the elimination of CO from the blood.

71-0396. McGrath, J. J., Jaeger, J. **Effect of Iodoacetate on the Carbon Monoxide Tolerance of the Chick.** *Respiration Physiology* 12(1):71-76, April 1971.

Chicks 0-3 weeks old were exposed to 1 percent carbon monoxide (CO) in air in a metabolic chamber at 35°C. Survival time as a function of age was determined and is defined as that period of exposure at which 50 percent of the animals lived. Body temperatures were monitored throughout the experiment by means of a rectal probe and an electric thermometer. Newly hatched birds were more resistant to CO and lived in excess of 30 minutes. Survival times decreased rapidly with age and reached 4 minutes by day 8, an age associated with the onset of homeothermy in chicks. There was a linear relationship between survival time and decrease in rectal temperature. The youngest birds underwent the greatest decrease in rectal temperature in response to CO and survived the longest. The increased initial tolerance to CO exposure was blocked by iodoacetate treatment. The CO tolerance of the newly hatched chick appears to be dependent in part on the ability to reduce its energy requirements through a reduction in metabolism and to provide for its reduced energy requirements through anaerobic glycolysis. (Auth. Abs.)

71-0397. Meszaros, J. **The Effect of Some Cholinomimetic Drugs on Presynaptic Inhibition in the Lateral Geniculate Nucleus.** *Neuropharmacology* 10(1):67-76, January 1971.

The effects of nicotine, physostigmine and pilocarpine on the excitability of intrageniculate optic tract terminals, amplitude of orthodromic lateral geniculate responses and the presynaptic inhibition evoked in the lateral geniculate nucleus by stimulation of the reticular formation or the visual cortex were studied. Nicotine decreased or abolished the presynaptic inhibition, with a simultaneous increase in the resting excitability of presynaptic optic tract terminals. Similar effects were observed after physostigmine. Pilocarpine did not have any significant effect on the presynaptic inhibition or on the resting excitability of optic tract fibers. The results were interpreted as indicating that N-cholinergic mechanisms take part in the presynaptic inhibitory activity of the lateral geniculate nucleus. (Auth. Abs.)

71-0398. Mikulka, P., O'Donnell, R., Heinig, P., Theodore, J. **The Effect of Carbon Monoxide on Human Performance.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):409-420, October 5, 1970.

Ten nonsmoking, male students were used as subjects to determine the effects of CO on relatively simple applied performance tasks. Time estimating ability, psychomotor tracking performance, and ataxia were measured. Results showed that exposure to a CO-level of 125 ppm produced no effect on time estimation, no decrement in tracking performance, and no effect on the abilities measured by the ataxia battery.

71-0399. National Research Council. Division of Medical Sciences. Committee on Effects of Atmospheric Contaminants on Human Health and Welfare. **Effects of Chronic Exposure to Low Levels of Carbon Monoxide on Human Health, Behavior, and Performance.** National Academy of Sciences–National Academy of Engineering, Washington, D.C., 1969, 66 pp.

The importance of CO in the ambient air lies principally in its ability to combine with hemoglobin (Hb). The portion of Hb present in the form of carboxyhemoglobin (COHb) cannot combine with oxygen or carry oxygen from the lungs to body tissues Although other ferroproteins can combine with CO at very high partial pressures of CO, such reactions play no role in the effects of low-level CO exposures on man. The CO-Hb reaction is reversible, so that reduced CO exposure will eventually make Hb available for oxygen transport. A normal person breathing air devoid of CO has about 0.4 percent COHb in his blood. The amount by which the COHb concentration increases above this background level depends on the ambient CO level and on whether a steady state has been reached, which can take 12 hours or more. Tests have shown that COHb levels as low as two percent above the background level can significantly impair mental performance, probably through CO interference with oxygen delivery to brain tissue. No CO threshold has been found, but its existence has not been ruled out. Man can adapt to increased CO levels in the ambient air, at the cost of some reserve capacity for oxygenation, through such mechanisms as increased Hb concentration in the blood, increased cardiac output, possibly increased capillary blood volume, and perhaps slightly increased volume of pulmonary ventilation. The consequences of low levels of CO would probably be accentuated when there is less than normal oxygen in alveolar air, as in emphysema; when there is tissue hypoxia of a fetus because of limited blood flow to the placenta; and when there is tissue hypoxia of other organs with limited blood flow, such as the digits in peripheral vascular disease or the myocardium in coronary vascular disease. Evidence from epidemiologic studies indicates a slight increase in mortality among myocardial infarct patients if the ambient CO level is sustained above 10 ppm. Exposures to increased CO concentrations for short periods (1-2 hours) are innocuous unless or until the cumulative effect is such that the blood COHb level has been raised appreciably. From 4 to 6 hours are required to get halfway to a new plateau of blood COHb after a change in ambient CO concentration. It is the COHb level, rather than the CO concentration breathed at any moment, that counts. One-pack-a-day smokers have blood COHb levels of approximately 5 percent. Theoretically the CO in cigarette smoke could, independently of other smoke constituents, produce some adverse health effects.

71-0400. O'Donnell, R. D., Mikulka, P., Heinig, P., Theodore, J. **Low Level Carbon Monoxide Exposure and Human Psychomotor Performance.** *Toxicology and Applied Pharmacology* 18(3):593-602, March 1971.

The effects of 5 concentrations of carbon monoxide exposure on time estimation, tracking, and ataxia were studied in 10 humans. The tracking task required the subjects to keep a needle display dial from going off scale by manipulating a control stick. Levels of CO used were 0, 50, 125, 200, and 250 ppm, yielding mean carboxyhemoglobin levels from 0.96 to 12.37 percent in a 3-hr exposure. No significant symptoms were reported by the subjects, and no ability to detect the presence of CO was noted. No overall trend toward poorer estimates of a 10-sec interval occurred as a function of CO uptake, and tracking performance did not deteriorate over the course of the exposures to CO. There was a suggestion that subjects inhaling CO showed a different overall pattern of tracking performance over time than control subjects. It is concluded that the present data do not support the hypothesis that low level carbon monoxide exposure of humans results in performance decrement. Additional investigation is required to define the lower limit and extent of such exposure and to resolve conflicting views on this issue. (Auth. Abs.)

71-0401. Pappano, A. J., Rembish, R. A. **Negative Chronotropic Effects of McN A-343 and Nicotine in Isolated Guinea-Pig Atria: Insensitivity to Blockade by Tetrodotoxin.** *Journal of Pharmacology and Experimental Therapeutics* 177(1):40-47, April 1971.

McN A-343 reduced the firing rate of pacemaker cells in the isolated spontaneously beating right atrium of the guinea pig. Intracellularly recorded action potentials from these cells showed that the actions of McN A-343 were similar to those of acetylcholine. The negative chronotropic effect of McN A-343 was prevented by atropine but was not modified by hexamethonium or nicotine. Tetrodotoxin, in concentrations sufficient to block impulse conduction in vagal neurons, did not oppose the cardiac slowing produced by McN A-343, suggesting that the latter agent was acting at a site distal to vagal ganglion cells. Nicotine-induced depression of pacemaker activity was similarly unaffected by tetrodotoxin although it was prevented by McN A-343. In addition, nicotine retained its sympathomimetic activity in the presence of tetrodotoxin and restored action potentials to hearts poisoned by this agent, probably by release of catecholamines from intracardiac nerve terminals. (Auth. Abs.)

71-0402. Rathkamp, G., Hoffmann, D. **Chemical Studies on Tobacco Smoke. XIII. Inhibition of the Pyrosyntheses of Several Selective Smoke Constituents.** *Beitrage zur Tabakforschung* 5(6):302-306, December 1970.

Earlier studies demonstrated that polynuclear aromatic hydrocarbons (PAH) are selectively reduced in the smoke of alkali nitrate rich tobaccos. It was hypothesized, therefore, that in the burning cone of a tobacco product, the non-volatilized organic compounds are partially pyrolyzed to C,H-radicals that may combine with each other and form, among others, the thermodynamically favored PAH. Since there is in the burning cone of nitrate rich tobaccos an excess of thermically activated nitrogen oxides, it was assumed that these may react as scavengers for C,H-radicals and, with it, partially inhibit the PAH pyrosynthesis. This study was designed to challenge the above working hypothesis. For the experiments cigarettes were used to which were added various amounts of KNO_3 (0, 2.5, 5.0, 7.0, and 8.0 percent). As expected, the yields of nitromethane, nitroethane, and nitrobenzene in the smoke increased with the increase of nitrate in the tobacco and the yields of phenanthrene, benz(*a*)anthracene, and benzo(*a*)pyrene decreased. The concentration of naphthalene was only to a minor degree reduced with the increase of nitrates in the tobacco. One explanation for this observation could be that naphthalenes are primarily formed from specific tobaco terpenes, as suggested in the literature. As was expected, the smoke yields of N-unsubstituted and N-alkylated indoles were relatively little affected by the increase in the nitrate content, since these agents are predominantly formed from tryptophan.

71-0403. Ray, A. M., Rockwell, T. H. **An Exploratory Study of Automobile Driving Performance Under the Influence of Low Levels of Carboxyhemoglobin.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):396-408, October 5, 1970.

Three nonsmoking, male subjects were studied in a live highway environment to observe the changes in driving performance elicited by COHb blood levels of 20 percent and lower. Results showed that COHb levels below 10 percent had a detrimental effect on driving performance and that a brief exposure to a high CO concentration may result in performance decrement lasting many hours. Other adverse effects observed were increases in response time to taillight intensities, relative velocities, and normal driving velocity; and decreases in ability to maintain distances and to estimate time.

71-0404. Reckzeh, G., Dontenwill, W. **Versuchstier, Versuchstierhaltung and Tierversuch. [Experimental Animals, Their Maintenance and Testing.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 1-56, German.

Results of animal experiments are obtained by examining and comparing reactions of treated animals and untreated controls. The pattern and the intensity of the reactions depend upon the genetic characteristics of the animal strains and can be influenced by physico-chemical, social and microbiological changes of the environment as well as by differences in nutrition. Examples are presented for the interrelation between endogenous and exogenous factors and the results obtained in such experiments. For all experimental work with animals, closely controlled and standardized conditions are strongly recommended in order to obtain results which are comparable and reproducible. (Auth. Abs.)

71-0405. Richard, J. L., Lelouch, J., Claude, J. R., Schwartz, D. **Lipidemie, Consommation de Tabac et Corpulence. Etude d'une Population Masculine Active de 7.972 Sujets. [Lipidemia, Tobacco Consumption and Corpulence. Study of an Active Male Population of 7,972 Subjects.]** *Archives des Maladies du Coeur et des Vaisseaux* 11(3, Supplement 3):71-87, 1969, French.

The correlation between tobacco and lipidemia was studied in a Parisian population (7,972 subjects). A positive link was observed between tobacco and blood cholesterol. However, this was a weak link which appeared only when body weight was taken into consideration. There was no correlation after the age of 50. A correlation between tobacco and blood triglycerides was noted in certain isolated age groups but was not affected by taking body weight into consideration. These results agree with those generally reported in population studies and suggest that the link between tobacco and blood fats is very weak and cannot account for the risk of atherosclerosis in relation with tobacco smoking. (Auth. Abs. Mod.)

71-0406. Rondia, D. **Abaissement de l'Activite de la Benzopyrene-Hydroxylase Hepatique** ***In Vivo*** **Apres Inhalation d'Oxyde de Carbone. [Reduction in the Activity of Hepatic Benzopyrene Hydroxylase** ***In Vivo*** **After Inhalation of Carbon Monoxide.]** *Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences; D: Sciences Naturalles* 271(6):617-619, August 10, 1970, French.

The inhalation of carbon monoxide at concentrations of 60 to 100 volumes per million in air for 120 hours reduces the hepatic benzopyrene hydroxylase activity in the rat by 10 to 25 percent. This modification of activity is slow in stablizing itself.

71-0407. Ruddon, R. W., Rainey, C. H. **Comparison on Effects of Phenobarbital and Nicotine on Nuclear Protein Synthesis in Rat Liver.** *FEBS Letters* 14(3):170-174, April 30, 1971.

This study was conducted to determine if chronic administration of nicotine to rats, with doses that produce induction of microsomal enzymes, would lead to an increased synthesis of non-histone nuclear proteins. Nicotine effects were compared to those of inducing doses of phenobarbital. Male rats weighing 70-80 g were injected intraperitoneally with phenobarbital (75 mg/kg) prior to pulse labeling for 40 min with an intraperitoneal dose (200 microcuries) of leucine-4,5-^{3}H (58.2 curies/mmole), or treated chronically with nicotine in the drinking water in concentrations of 5 mg/kg/day for 7 days followed by a 40 minute pulse dose of leucine-^{3}H (340 microcuries). There was an increase in the incorporation of labeled leucine into the total non-histone nuclear protein fraction in the nicotine-treated rats. An absorbancy tracing of an electrophoretic run of hepatic nuclear proteins showed no difference between the absorbancy profile of the proteins extracted from nicotine-treated and control rats. The radioactivity contained in the major peaks was generally higher in the nicotine-treated samples, but when the ratio counts per minute for the treated and control animals were plotted from the radioactivity contained in the gels, there was an apparent selectivity to the labeling pattern. For nicotine, the most pronounced peak was 34 mm from the origin, while phenobarbital showed a peak approximately 10-12 mm down the gels.

71-0408. Sficas, A. G. **Irrigation Experiments on Oriental Tobacco.** *Beitrage zur Tabakforschung* 5(6):259-261, December 1970.

Irrigation experiments were conducted at the Tobacco Institute of Drama and the Tobacco Research Station of Xanthi on aromatic and on neutral (Kaba-Koulak) tobacco. Both tobacco types benefited highly from a moderate water supply from 40-80 m^3 per stremma. Yield was increased by about 20-30 percent and quality was also significantly improved. Nicotine content was reduced in a proportion of 5-10 percent. In the aromatic types, topping and close spacing gave significantly higher yield per stremma. The nicotine level was higher with topping and lower with close spacing. (Auth. Abs.)

71-0409. Steffens, G. L., Alphin, J. G., Ford, Z. T. **"Ripening" Tobacco With the Ethylene-Releasing Agent 2-Chloroethylphosphonic Acid.** *Beitrage zur Tabakforschung* 5(6):262-265, December 1970.

Treatment of flue-cured tobacco with the ethylene releasing agent 2-chlorethylphosphonic acid (CEPA) caused mature leaves to lose their green color and turn yellow. The treated leaves appeared to go through a partial "yellowing" or "coloring" phase prior to harvest. Treated leaves at harvest contained greater amounts of reducing sugars and lower levels of starch, relative to comparable untreated leaves. At the end of the curing process, comparisons between treated and untreated leaf showed that only small differences existed in total nitrogen, total alkaloids, starch, and reducing sugars. Statistically, protein of leaf treated with CEPA was significantly lower as compared to untreated leaf. For all yellowing times, dollar values per hundred weight of cured leaf from treated plants were higher than from untreated plants, but the average weight per leaf from treated plants was lower. During the curing process leaf treated with CEPA can probably be subjected to shorter periods of yellowing or coloring than untreated leaf. If further work with "ripening" chemicals such as CEPA show that they can be used to hasten yellowing or ripen tobacco successfully, as well as to reduce the time required for curing the crop, economic advantages are likely to accrue. It is to be hoped that such chemicals may help reduce the labor and investment required for crop production, and at the same time improve crop quality. (Auth. Abs.)

71-0410. Stupfel, M., Bouley, G. **Physiological and Biochemical Effects on Rats and Mice Exposed to Small Concentrations of Carbon Monoxide for Long Periods.** In: Coburn, R. F. (Editor). Biological Effects of Carbon Monoxide. *Annals of the New York Academy of Sciences* 174(Art. 1):342-368, October 5, 1970.

Pathogen-free rats and mice were exposed, five days per week, to 50 ppm of CO for periods extending from three months to two years. During the first three months, fecundation, reproduction, growth, CO_2 emission, weights and water percentages of different organs, hemoglobinemia, protidemia, lipemia, calcemia, magnesemia, serum transaminases, hematological data, experimental *Serratia marcescens* infection and immunization and also Guerin's grafted tumor's evolution were not modified. Cholesterolemia, heart pulse rates, ECG tracings and avoidance conditioning appeared to be slightly altered at the beginning of exposure. During the two-year exposure, mortality and aging processes such as nephrosis, aortic calcification, spontaneous tumors, were not modified by 50 ppm of CO. As could be seen from experiments with three groups of animals (in a 50-ppm CO chamber, in a chamber with no CO, and outside the chambers), putting rats into an enclosure affects body growth, heart rate, ECG patterns, and avoidance conditioning. In general, that proves the importance of ecological factors (confinement, odors, noise, humidity, temperature), in such long-term exposure to very small doses of CO. (Auth. Abs.)

71-0411. Tamura, T., Inoue, H., Iida, T., Ono, H. **Studies on the Antidotal Action of Drugs. Part I. Vitamin C and Its Antidotal Effect Against Alcoholic and Nicotine Poisoning.** *Journal of Nihon University School of Dentistry* 11:149-151, 1969.

Vitamin C (400 mg/kg) and in combination with glucose-cysteine were tested for their antidotal effect against acetaldehyde (10 mg/kg) and nicotine (31 ml/kg) in DD strain male mice. The combination of vitamin C with glucose-cysteine showed a greater antidotal effect against both nicotine and acetaldehyde than vitamin C alone.

71-0412. Theodore, J., O'Donnell, R. D., Back, K. C. **Toxicological Evaluation of Carbon Monoxide in Humans and Other Mammalian Species.** *Journal of Occupational Medicine* 13(5):242-255, May 1971.

This study was concerned with the effects of contինous long-term (CO) carbon monoxide exposure on various animal species and, in particular, on the lever pressing performance of rhesus monkeys; and the effects of short-term low-level CO exposure on human tracking performance. Exposure to relatively high levels of CO (460 and 575 mg/m^3) for 168 days had no affect on animal survivability, growth rates, or clinical chemistry, and failed to produce pathologic changes in the CNS. The most prominent effect due to CO was the marked erythrocytosis seen during chronic exposure. No performance decrements were observed in either the rhesus monkeys up to CO levels of 440 mg/m^3 or in humans during three hours of exposures of 50 to 250 ppm CO. It was concluded that if CO at these levels had an initial adverse effect, adaptive processes must take place early during exposures, and the compensatory changes override the initial CO effect.

71-0413. Tobacco Research Council. **Review of Activities, 1967-69.** Tobacco Research Council, London. 1970. 60 pp.

Research activities directed by the Tobacco Research Council in the field of smoking and health are reviewed. The largest effort was directed to the closely related fields of chemical research and biological testing. Bio-assay work was primarily concerned with the possible roles of cigarette smoking in lung cancer and was based on the working hypothesis that cigarette smoke affects the respiratory epithelium by direct contact. Further progress was made in narrowing down the fractions of smoke condensate which are mainly responsible for carcinogenicity as measured by a series of tests on the skin of mice. A series of studies was conducted to provide information about personal, environmental and other factors in the diseases associated with smoking, and cover not only lung cancer but also bronchitis and heart disease, and to a less extent, some other conditions. Some information has been obtained about the characteristics of men and women in high risk groups. Another series of projects was directed toward understanding the motives for smoking in terms of a complex interaction of subjective psychological factors and objective pharmacological effects.

71-0414. Townes, B. I., Sheen, S. J. **Changes of Alkaloid Composition During Curing in Three Isogenic Burley Tobaccos and Their F_1 Hybrids.** *Beitrage zur Tabakforschung* 5(6):279-289, December 1970.

Quantitative changes of nicotine, nornicotine, anabasine (including anatabine), and total alkaloids in the juvenile leaves and roots of *Nicotiana tabacum* cv. Burley 21 (HN) and its isogenic lines selected for nictone conversion (C), and low total alkaloids (LN) were studied during air-curing simulation. In the leaf, the C line contained less total alkaloids but more nornicotine than the HN line, suggesting that some may have been converted to nornicotine during leaf growth. The conversion phenomenon was not observed in the root. The root tissues of the LN line showed a high rate of nicotine decomposition at the inception of curing. On the basis of F_1 results, both total alkaloids and nicotine conversion are governed by dominant factors. An intermediate nornicotine/nicotine ratio for the cured leaves of the LN and C hybrids indicated the presence of converter modifiers in the LN line. In the C line and its hybrids the decrease of nicotine content mainly occurred at the beginning of curing, whereas the nornicotine increase appeared after the eighth day of curing. The amount of anabasine was increased in the leaf but was decreased in the roots by curing. (Auth. Abs.)

71-0415. Van Duuren, B. L., Blazej, T., Goldschmidt, B. M., Katz, C., Melchionne, S., Sivak, A. **Cocarcinogenesis Studies on Mouse Skin and Inhibition of Tumor Induction.** *Journal of the National Cancer Institute* 46(5):1039-1044, May 1971.

Various tobacco leaf and tobacco smoke components and related synthetic compounds were tested for cocarcinogenic activity on mouse skin by simultaneous and repeated application with benzo(*a*)pyrene. The potent tumor-promoting agent, phorbol myristate acetate, was also tested and showed pronounced cocarcinogenic activity. Linalyl oleate and linalyl acetate showed weak cocarcinogenic activity. Linalyl laurate and the three corresponding esters of borneol showed no cocarcinogenic activity. Administration of phenol, rutin, and morin resulted in a decreased tumor yield and/or delayed tumor appearance when compared to benzo(*a*)pyrene administered alone. (Auth. Abs.)

71-0416. Vich, V. **Otrava Kyslichikem Uhelnatym. [Carbon Monoxide Poisoning.]** *Pracovni Lekarstvi* 22(7):255-258, September 1970, Czech.

Highlights of carbon monoxide poisoning with reference to tobacco smoke are presented in this literature review. The clinical picture shows disturbances of various reflexes as well as altered respiration, often of the Cheyne-Stokes type, and a high assay of carboxyhemoglobin. The pathogenesis involves the development of a number of symptoms, such as secondary hypoxemia in the myocardium, and hyperglycemia as the saccharide metabolism becomes disturbed. There is, however, an adaptation mechanism which goes into action in cases of chronic carbon monoxide poisoning as in the case of smokers. Other symptoms include anoxia and ischemic malacias, necroses and comatoses. The causal treatment strives to restore the hemoglobin and to dissipate the carboxyhemoglobin, as in the case of insufflation of oxygen, or by hyperbaric oxidation. The symptomatic treatment is directed against anoxia. Brain afflictions due to carbon monoxide poisoning are numerous and they are often seen in heavy smokers. These symptoms, which may not at first be attributed to carbon monoxide from smoke, include somnolence, disorientation, and motor and psychic disturbances. Carbon monoxide poisoning is diagnosed on the basis of certain symptoms, such as pyramidic irritation phenomena leading to an asymmetric Babinski reflex, accompanied by miosis and bradycardia.

71-0417. Weber, K. H. (Editor) **Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch. [The Method of Investigation of Smoke Condensates in Animal Experiments.]** Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, 119 pp., German.

The publication consists of seven separate reports dealing with the preparation of the smoke and the testing of cigarette smoke constituents in laboratory animals. The reports include data on the maintenance of laboratory animals, the measurement of fluorescence in cigarette smoke condensate, the alkylating effect of cigarette smoke condensate, the alkylating effect of cigarette smoke condensate, and the mathematical aspects of the planning and evaluation of experiments in cancer research.

71-0418. WHO Chronicle. **Public Health Aspects of Climate in Cities.** *WHO Chronicle* 25(4):161-167, April 1971.

The problems of urban climatology and the related ones of air pollution and its effects on human health are discussed. Highlighted are the effects of motor vehicle pollutants, including sulfur dioxide, ozone, lead, and carbon monoxide. Special emphasis is given to carbon monoxide, which in traffic exhaust fumes can lead to blood carboxyhemoglobin concentrations of 3-4 percent. Although evidence shows that no psychomotor effects are produced, synergistic effects may occur in subjects under stress or under the influence of central nervous system depressants. Carcinogenic polycyclic compounds have also been found in some particulate emissions from diesel and petrol engines, and it is believed that motor vehicle exhaust may contribute to the occurrence of lung cancer. Nevertheless, its role is small in comparison with that of cigarette smoking.

71-0419. Wohlrab, H., Ogunmola, G. B. **Carbon Monoxide Binding Studies of Cytochrome a_3 Hemes in Intact Rat Liver Mitochondria.** *Biochemistry* 10(7):1103-1106, March 30, 1971.

Cytochrome a_3 of intact rat liver mitochondria has been titrated anaerobically with carbon monoxide. A new technique has been used which allows titrations to be completed in less than 10 min. The equilibrium constant (K) between cytochrome a_3 and carbon monoxide was found to be $(2.15 \pm 0.3) \times 10^6 M^{-1}$ with a Hill coefficient (n) of 1.1 ± 0.1. Both of these values are not affected by a variation in pH from 6.1 to 7.8 and by the presence of uncoupling concentrations of uncouplers. The results demonstrate that there is no functional interaction between reduced a_3 proteins. The lack of effect of the very tightly bound uncoupler molecules on the K suggests that the binding site of the uncoupler is not on the a_3 protein. When adenosine triphosphate is added to anaerobic coupled mitochondria in the presence of *N,N,N',N'*-tetramethyl-*p*-phenylenediamine, ascorbate, and succinate, the K changes to $(1.1 \pm 0.1) \times 10^6 M^{-1}$ while the n value remains unchanged. The fact that carbon monoxide is an uncharged molecule and does not respond to potential and proton gradients set up by the adenosine triphosphate and that the K between CO and a_3 is independent of pH, demonstrates an energy-linked structural change in the a_3 which is not due to a pH change resulting from a proton gradient set up by ATP across the inner mitochondrial membrane and which results in a reduced affinity for carbon monoxide. The reduction of O_2 by a_3 consists of two basic processes: (1) a pH-independent binding of O_2 to a_3 and (2) a pH-dependent oxidation of $a3$ by O_2. A lower limit for the favorable free-energy change associated with the first process was estimated to be −560 mV. (Auth. Abs.)

See also, **71-0453, 71-0467, 71-0511, 71-0512, 71-0513, 71-0527**

MORTALITY AND MORBIDITY

71-0420. Journal of the American Osteopathic Association. **The Relationship Between Smoking and Health: A Review.** *Journal of the American Osteopathic Association* 70(7):720-726, March 1971.

Highlighted in this review are a chronological summary of those studies linking smoking to human diseases, the Surgeon General's 1964 Report on Smoking and Health, the establishment of the National Clearinghouse on Smoking and Health, the law requiring that all cigarettes packages bear a warning label, and in 1971, the ban of cigarette advertising on television and radio.

71-0421. McDonald, J. C., McDonald, A. D., Gibbs, G. W. Siemiatycki, J., Rossiter, C. E. **Mortality in the Chrysotile Asbestos Mines and Mills of Quebec.** *Archives of Environmental Health* 22(6):677-686, June 1971.

Of 11,788 persons born between 1891 and 1920 employed in the Quebec asbestos mining industry, 88.4 percent were traced. Of these, 2,457 (23.6 percent) had died. Exposure indexes for each worker were calculated from job dust levels and duration of employment. The overall mortality was lower than expected for the population of Quebec but in the highest dust category, comprising 5 percent of the cohort, the age-standardized rate was 20 percent higher than in other groups. Respiratory, cardiovascular, and malignant disease in equal proportions accounted for the excess. There were 101 deaths from respiratory cancer including three from malignant mesothelioma, an estimated excess of about 15 deaths. The difference in rates for respiratory cancer between those maximally and minimally exposed was fivefold and, though perhaps exaggerated, was apparently determined by accumulated dust exposure and duration of employment. A random sample of over 1,000 current employees showed little or no relationship, after allowing for age, between smoking habits and either dust exposure or duration of employment.

71-0422. Ochsner, A. **The Health Menace of Tobacco.** *American Scientist* 59(2):246-252, March-April 1971.

The link between tobacco and lung cancer and other equally serious conditions caused or aggravated by tobacco are discussed, including other cancers, vascular deterioration, pulmonary disease, reproductive disorders, ulcers, disabling illness and premature deaths, and economic loss.

71-0423. Schuman, L. M. **The Benefits of Cessation of Smoking.** *Chest* 59(4):421-427, April 1971.

Various studies are cited to compare morbidity and mortality statistics among smokers, ex-smokers and nonsmokers for several chronic diseases, including lung cancer, other cancers, coronary heart disease, cardiovascular diseases and bronchopulmonary diseases. Cessation of smoking is shown to significantly reverse a number of these disease processes and arrest others.

See also, **71-0384, 71-0427, 71-0503**

NEOPLASTIC DISEASES

71-0424. Bignon, J., Goni, J., Bonnaud, G., Jaurand, M. C., Dufour, G., Pinchon, M. C. **Incidence of Pulmonary Ferruginous Bodies in France.** *Environmental Research* 3(5/6):430-442, December 1970.

A method of chemical digestion and microfiltration of lung tissue has shown that ferruginous bodies, with a transparent central fiber or invisible core, were present in the lungs of all cases in a series of 100 French people, aged 13 and over, both Parisians and country dwellers. The number of ferruginous bodies, counted in respect to their frequency per cm^3 of lung, increased with age and in Parisians. While no significant relationship was found with either sex or occupational history, a greater frequency of ferruginous bodies was found in cases with primary lung cancer than with other diseases. Eleven of 12 primary lung cancer cases were smokers, whereas only 6 had over 100 ferruginous bodies/cm^3 of lung. There were fewer smokers among cases without primary lung cancer and the number of ferrunginous bodies was less, even in patients with obstructive lung disease. A new method, using the scanning electron microscope, that assists in identifying the central fiber of the ferruginous bodies is described.

71-0425. Bock, F. G. **Tumor-Promoting Activity of Tobacco Extracts.** *Journal of the Indian Medical Profession* 17(3):7561-7564, June 1970.

Commercial cigarette tobaccos are a potent source of tumor-producing activity, the activity depending on the presence of at least two agents, one of which has a large molecular weight and the other a small molecular weight. Inasmuch as extracts of commercial English cigarettes were active, the activity does not depend on the additives used during the manufacture of American cigarettes. On the other hand, fresh leaves of several tobacco strains that were raised in a field without chemical insecticides or suckering agents yielded extracts which were only very weakly active. The higher activity of commercial cigarette tobacco is possibly due to increased quantities of the component of large molecular weight which in turn may be a tobacco pigment.

71-0426. Bors, G., Kisbenedek, L. **A Dohanyzas Szerepe a Holyagdaganatok Keletkezeseben. [The Role of Smoking in the Development of Tumors of the Bladder.]** *Magyar Onkologia* 14(4):230-232, 1970, Hungarian.

The results show that smoking is not one of the special causes of bladder tumor, but rather a cocarcinogenic factor to be taken into consideration. Papillomatous patients should not smoke since the statistical data show that smoking has an unfavorable effect with respect to the development of bladder tumors and can also promote the relapse of papillomas.

71-0427. Doll, R., Morgan, L. G., Speizer, F. E. **Cancers of the Lung and Nasal Sinuses in Nickel Workers.** *British Journal of Cancer* 24(4):623-632, December 1970.

Men employed in a nickel refinery in South Wales were investigated to determine whether the specific risks of developing carcinoma of the bronchi and nasal sinuses, which had been associated with the refining of nickel, are still present. The data obtained were also used to compare the effect of age at exposure on susceptibility to cancer induction and to determine the rate of change of mortality after exposure to a carcinogenic agent had ceased. Eight hundred and forty five men were studied who had been employed in the industry for at least 5 years and whose first employment was in or before April 1944. Altogether 482 of the men had died: 113 from lung cancer and 39 from nasal cancer. In men employed before 1925, deaths from lung cancer varied from about 5 to 10 times the numbers that would have been expected from the corresponding national mortality rates, while the deaths from nasal cancer varied from about 100 to 900 times the expected numbers. Among men first employed in 1925 or after there were 8 deaths from lung cancer against 6.2 expected and no deaths from nasal cancer. The death rate from causes other than cancer was similar to that experienced by men in the same geographical area irrespective of their date of first employment. Susceptibility to the induction of nasal cancer increased with age at first exposure, but susceptibility to the induction of lung cancer varied irregularly. The trends in susceptibility showed some similarity to the trends in the national mortality among men employed at similar ages. It is suggested that susceptibility to cancer induction is determined by the amount of previous exposure to other agents. The risk of developing nasal cancer persisted with little change 15 to 42 years after the carcinogen was eliminated whereas the risk of developing lung cancer decreased. If the effects of cigarette smoking and the specific occupational hazard interact, the reduction in the risk of lung cancer could be due to the differential elimination of heavy cigarette smokers. (Auth. Abs. Mod.)

71-0428. Hammond, E. C., Auerbach, O., Kirman, D., Garfinkel, L. **Effects of Cigarette Smoking on Dogs.** *Ca* 21(2):78-94, March-April 1971.

Tracheostomy was performed on 97 male beagle dogs. All but 8 (group N) were trained to smoke cigarettes over the first 56 days through tubing from a cigarette holder to the tracheostoma. Two died and one was withdrawn during this period. The remaining 86 dogs trained to smoke were divided into groups on day #57. From then on, 12 (group F) dogs smoked filter-tip cigarettes and the other 74 smoked nonfilter cigarettes. Of the dogs smoking nonfilter cigarettes, 24 (group H) and 38 (group h) smoked twice as many cigarettes as the other 12 (group L). By day #875, none of the N dogs, 2 F dogs, 2 L dogs, 12 H dogs and 12 h dogs had died. Several of the H and h dogs but none of the other dogs died of cor pulmonale. Starting on day #876 all surviving N, F, L and H dogs were sacrificed and lung sections were examined microscopically. The lung parenchyma of the nonsmoking dogs (group N) was normal while pulmonary histopathological changes (fibrosis, emphysema, etc.) were found in all smoking dogs. Greatest changes were found in the lungs of dogs smoking nonfilter cigarettes most heavily. Noninvasive bronchiolo-alveolar tumors were found in dogs of all five groups. Invasive bronchiolo-alveolar tumors were found only in dogs smoking nonfilter cigarettes most heavily (groups H and h): in 2 of 12 group h and H dogs, respectively, which died, and 8 of 12 H dogs which were sacrificed. One tumor extended to the pleura and four tumors extended into the pleura. Early invasive squamous cell carcinoma was found in bronchi of 2 of 12 group H dogs which were sacrificed. The findings strongly suggest that smoking cigarettes with an efficient filter will produce less damage to the human lung parenchyma than smoking identical cigarettes without filters. It was concluded that the smoking of a large number of nonfilter cigarettes daily for over two years can lead to the development of invasive bronchiolo-alveolar tumors in male beagle dogs. (Auth. Abs.)

71-0429. Hurlburt, J. F., Schulson, N. G. **Study of Asbestos Workers in British Columbia.** *British Columbia Medical Journal* 13(3):58,67-68, March 1971.

Thirty-three asbestos insulation workers were examined with a view to assessing the incidence of asbestos-related pulmonary disease in British Columbia. Results were largely negative, revealing no cases of asbestosis, pleural plaques, or malignancy. Eight subjects had chronic bronchitis and three others were asthmatics. Sputum sample smears from five subjects showed the presence of asbestos bodies. Lung function test results showed that just under 40 percent of the subjects had reduced FEV_1's and over 20 percent had reduced vital capacities. Only one worker had an abnormal diffusing capacity. Smoking histories indicated that of 29 onetime regular cigarette smokers, 19 had stopped smoking, a majority within the past five years. Reasons given for stopping indicated a high degree of awareness among these men of the dangers of smoking and working with asbestos, a combination carrying a greatly increased risk of bronchogenic carcinoma.

71-0430. Lancet. **Smoking and Cancers of the Bladder and Kidney. (Editorial)** *Lancet* 1(7700):635-636, March 27, 1971.

The question of whether the finding of an association between exposure to an agent and the risk of occurrence of a particular disease in a retrospective study can establish a cause-and-effect relationship is discussed in view of what some pertinent research publications have so far reported concerning the relationship of smoking and cancers of the bladder and kidney. The need for evidence from prospective studies and the elucidation of the causal mechanism is emphasized.

71-0431. Misfeld, J., Timm, J. **Mathematische Aspekte der Planung und Auswertung von Experimenten zur Krebsforschung. Dargestellt am Beispiel der Untersuchung von Zigarettenrauchkondensaten. [Mathematical Aspects of the Planning and Evaluation of Experiments in Cancer Research. Presented Using the Investigation of Cigarette Smoke Concentrates as an Example.]** In: Weber, K. H. (Editor). *Zur Methodik der Untersuchung von Rauchkondensaten im Tierversuch.* Hamburg, Wissenschaftliche Forschungsstelle im Verband der Cigarettenindustrie, 1969, pp. 85-119, German.

The mathematical-statistical methods are explained using the animal experiment testing of cigarette smoke condensate on mouse skin. The methods are useful for the solution of other theoretical and practical problems of this type.

71-0432. Nagrath, S. P., Hazra, D. K., Lahiri, B., Kishore, B., Kumar, R. **Primary Carcinoma of Lung: Clinico-Pathological Study of 35 Cases.** *Indian Journal of Chest Diseases* 12(1/2):15-25, January-April 1970.

Of 25,346 consecutive radiological examinations of patients attending the Tuberculosis Clinic S. N. Hospital, Agra, India, during the period 1950-1959, 35 cases of histologically proved primary carcinoma of the lung were detected and studied. These cases ranged in age from 13 to 70 years with a male to female ratio of 4:1. All of the squamous carcinoma cases, 71.4 percent of the undifferentiated carcinoma cases and 33 percent of the adenocarcinoma cases gave a positive history of heavy smoking. Of 23 smokers, 17 were bidi smokers. Common symptoms and signs and the relative value of various investigations in proving the diagnosis of bronchogenic carcinoma are discussed. The importance of a high clinical index of suspicion for this disease is stressed.

71-0433. Nature. **Premature Puff for Smoking Beagles.** *Nature* 230(5296):547-548, April 30, 1971.

The controversy concerning the Hammond-Auerbach study on the effects of cigarette smoking in beagles is reviewed. The study was first presented at a press conference arranged by the American Cancer Society (ACS) in February 1970 and an article on the study appeared in the *Medical World News*. The study was offered for publication in the *New England Journal of Medicine* but was rejected because so much of its substance had previously appeared in the *Medical World News*. It was then offered to the *Journal of the American Medical Association* but because the journal's referees called for revisions described as "quite fundamental", the authors decided to submit the paper to the *Archives of Environmental Health* where it was published in December 1970 with only minor revisions. Between the pre-publication conference and publication a battle raged between the ACS and the Tobacco Institute; the latter taking issue with the ACS on the basis that the study was unpublished and therefore unassailable for many months after the press conference. Some misleading accounts of the study have also been quoted by persons using the pre-publication version of the study. The delay in publication gave the Tobacco Institute an opportunity to try and discredit what may be a significant contribution to the cigarette-cancer issue. The controversy indicates that publication should, where possible, preceed excessive publicity.

71-0434. Rimington, J. **Smoking, Chronic Bronchitis, and Lung Cancer.** *British Medical Journal* 2(5758):373-375, May 15, 1971.

A follow-up was carried out on 21,579 male mass radiography volunteers aged at least 40 who had been the subject of an earlier investigation in which their smoking habits and sputum production were recorded and the prevalence of lung cancer was determined after chest X-ray examination. During the follow-up period, which was a minimum of 36 months and a maximum of 56 months, 64 new cases of lung cancer were identified by cross checking records with the registers of the regional cancer registration bureau. A significantly higher incidence of lung cancer was found in those with chronic bronchitis than in those without this disease. In the smoking categories, cigarette smokers with chronic bronchitis had a higher incidence than those without it, and this relationship was maintained irrespective of age and amount smoked. It is concluded that persons who smoke run a higher risk of chronic bronchitis than nonsmokers and those who develop bronchitis run a higher risk of developing lung cancer. (Auth. Abs.)

71-0435. Suri, K., Goldman, H. M., Wells, H. **Carcinogenic Effect of a Dimethyl Sulphoxide Extract of Betel Nut on the Mucosa of the Hamster Buccal Pouch.** *Nature* 230(5293):383-384, April 9, 1971.

The occurrence of leukoplakia and tumors was studied in the buccal pouches of 9-week-old male, golden Syrian hamsters after chronic topical application of dimethyl sulfoxide (DMSO) extracts of betel nut, and of betel nut and tobacco mixture. Results showed that betel nut extracts caused tumors in 38 percent and leukoplakia in 90 percent of the hamsters; the betel nut and tobacco mixture caused tumors in 76 percent and leukoplakia in 85 percent; tobacco extracts caused leukoplakia in 66 percent, but no tumors; and the control solution (100 percent DMSO) produced neither tumors nor leukoplakia. The contention that lime salts are the carcinogen was not supported by the results since lime salts were not added to the extracts. Nor was tobacco considered a carcinogen; however, tobacco does contain materials which can enhance the carcinogenic actions of substances in betel nut. Possibly a carcinogenic action of the tobacco extract could have been demonstrated in a longer experiment or if a more potent extract had been used.

See also, **71-0413, 71-0415, 71-0421, 71-0422, 71-0462, 71-0514**

71-0436. Coudray, P., Serise, M., Freour, P. **Recherche Epidemiologique sur les Bronchites Chroniques et les Insuffisances Respiratoires. Etude de Prevalence Dans un Echantillon de Femmes de 30 a 70 Ans. [Epidemiologic Study of Chronic Bronchitis and Respiratory Insufficiency. Prevalence in a Sample of Women 30 to 70 Years of Age.]** *Revue de Tuberculose et de Pneumologie* 33(6):769-780, September-October 1969, French.

In an examination of an urban female population (2000 subjects) in Bordeaux, France, aged from 30 to 70 years, aimed at determining the importance of bronchorespiratory syndromes, 12.23 percent indicated relatively important syndromes and 17.53 percent showed slight syndromes. Age and smoking habits augmented the frequency of incidence. A past history of allergies and pleurisy with the appearance of severe dyspnea was very important. The female population was almost equally affected as a sample of males of the same type when the influence of tobacco predominant in males was not considered. A greater incidence was observed in this population than in one of female Parisian employees. The figures indicate a higher incidence of chronic bronchitis when compared with those from other countries.

71-0437. Diamond, L., Lipscomb, W., Johnson, R. **Acute Pulmonary Effects of Smoking a Reference Cigarette.** *Toxicology and Applied Pharmacology* 18(3):638-648, March 1971.

The acute pulmonary effects of smoking a reference cigarette of known, standard composition have been studied in 30 subjects grouped according to their smoking habits. The results of selected ventilatory function tests did not change significantly after smoking. Inspiratory and expiratory lung airflow resistance was estimated before and after smoking by transiently occluding the subject's airway during tidal breathing, measuring the transairway pressure at the instant of interruption and relating the latter pressure to the rate of airflow recorded immediately prior to interruption. Control pulmonary resistance values obtained just prior to smoking were highest in the group of heavy smokers and in this group smoking produced a significant decrease in expiratory resistance to airflow. In nonsmokers inhalation of cigarette smoke resulted in a significant increase in expiratory resistance, but the site of the reduction in airway caliber was not determined. (Auth. Abs.)

71-0438. Dunnill, M. S., Ryder, R. **A Quantitative Study of the Relationship Between Chronic Bronchitis, Emphysema and Smoking.** *Chest* 59(5, Supplement):35S-36S, May 1971.

The lungs of 353 patients at autopsy were examined using the point counting technique to estimate the percentage bronchial mucous gland volume and the percentage volume of emphysema in the lung parenchyma. In the 179 cases in which a smoking history was available, the mean percentage volume of bronchial mucous glands was 17.6 in the 106 smokers and 14.5 in the 73 nonsmokers. The mean percentage volume of parenchyma involved with emphysema in smokers was 10.8 and in nonsmokers, 1.7. Although there was no obvious relationship between mucous gland volume and the volume of lung parenchyma involved in emphysema, the mean percentage bronchial mucous gland volume was significantly larger in the cases with emphysema as compared with those cases without emphysema. The findings indicate not so much that emphysema is due to chronic bronchitis but that both are influenced by smoking. However, smoking seems to play a much more clear cut role in the etiology of emphysema.

71-0439. Falk, G. A., Briscoe, W. A. **Alpha$_1$-Antitrypsin Deficiency in Chronic Obstructive Pulmonary Disease. (Editorial)** *Annals of Internal Medicine* 72(3):427-429, March 1970.

Clinical and serologic observations show a definite association between homozygous alpha$_1$-antitrypsin deficiency and chronic obstructive pulmonary disease. It has been postulated that proteolytic enzymes are continually released into the pulmonary parenchyma by alveolar macrophages or other phagocytic cells and that alpha$_1$-antitrypsin from serum normally inactivates these enzymes before they can digest the alveolar septa. Progressive damage to bronchial and alveolar structures may result from an alpha$_1$-antitrypsin deficiency. Inhaled irritants (cigarette smoke and other air pollutants) or chronic bronchopulmonary infection are likely to increase the rate of enzyme release, and the observed association of these factors with emphysema is consistent with an enzymatic mechanism of injury. Although serum alpha$_1$-antitrypsin deficiency has been found in only a minority of patients, the possibility of an enzymatic mechanism of tissue destruction must be considered even in those patients with normal serum alpha$_1$-antitrypsin levels. The question of whether the diverse clinical and pathologic manifestations of the disease originate primarily from destruction of alveolar septa or from inflammatory and obstructive bronchial lesions, or whether the primary site of pathology differs in the type A emphysematous patient or type B chronic bronchitic patient, has not been resolved. However, the clinical picture of disease association with alpha$_1$-antitrypsin deficiency is sufficiently varied that a pathogenic role of proteolytic enzymes must be considered in both varieties of chronic obstructive pulmonary disease.

71-0440. Fallat, R., Powell, M., Kueppers, F., Nadel, J. B., Murray, J. **Chronic Obstructive Pulmonary Disease With Intermediate Alpha$_1$-Antitrypsin Deficiency.** *Chest* 59(5, Supplement):20S-22S, May 1971.

Clinical, physiologic and radioisotopic studies of 12 homozygotes and 56 heterozygotes (including 9 and 28 smokers, respectively) with alpha$_1$-antitrypsin deficiency showed that heterozygotes often develop obstructive lung disease similar to that in homozygotes, but with later onset and less severity, and that smoking may be an aggravating factor in heterozygotes. It was concluded that airway obstruction, scattered perfusion defects and decreased ventilation of the lung bases are common features in both groups with alpha$_1$-antitrypsin deficiency, and that these findings are more frequent and more severe in homozygotes and cigarette smokers.

71-0441. Fournier, E., Zivy, P. **Poumon et Tabac. [The Lung and Tobacco.]** *Poumon et le Coeur* 26(9):1109-1125, 1970, French.

In dealing with tobacco lung, various lesions can be grouped experimentally and clinically. Chronically toxic lungs with specific pneumoconiosis in which chronic bronchitis, sclerosis, and bullous emphysema predominate are studied. The most common is a sclerous bullogenic form with a generally apical origin, susceptible to spontaneous idiopathic pneumothorax complications. The effect of smoke on intra-alveolar tension intervenes in the origin or evolution of the bullae, their apical location, and their possible dehiscence. The majority of spontaneous idiopathic pneumothorax cases observed after 25 years relate to alveolar tobaccoism. The disparity in observed disorders at equal consumption is difficult to explain outside of the fact of a hypersensibility to tobacco agression. Tobacco lung may be fatal due to respiratory insufficiency or carcinogenesis. More than ever before, there is a greater general tobacco-caused intoxication due to cigarettes and smoke inhalation.

71-0442. Golli, V. **Etude Epidemiologique des Bronchopathies Non Specifiques. [Epidemiologic Study of Non-Specific Bronchopathies.]** *Bronches* 20(5):313-330, September-October 1970, French.

The questionnaire survey undertaken confirms that nonspecific bronchopathy can justifiably be called a "social disease" because it affects a large proportion of the general population: about one person in eight manifests some symptom of bronchial irritation, symptoms which two-thirds of the time indicate chronic bronchitis. The frequency of the syndromes augments significantly with age, and males are more often affected. In the total population, smokers are affected four times more often than nonsmokers. In young subjects, the use of tobacco dominates the bronchial etiology; in older subjects, although bronchopathy increases sensibly in smokers, it also increases in nonsmokers and, other etio-pathogenic factors are found to intervene. Air pollution doubles the risk of bronchitis but when comparing the two irritating factors, smoking is found to be predominant. The principal task in the prophylaxis of nonspecific bronchopathy, in which the progressive evolution towards respiratory insufficiency is well-known, should be directed at purification of inspired air which includes the cessation of smoking.

71-0443. Guenter, C. A., Welch, M. H., Ferguson, S., Henderson, L., Hammarsten, J. F. **Alpha$_1$-Antitrypsin Deficiency: Heterozygosity, Intermediate Levels, and Pulmonary Disease.** *Chest* 59(5, Supplement):16S-17S, May 1971.

This study attempted to correlate the prevalence of pulmonary disease and antitrypsin levels in three different populations. Spirograms and serum trypsin inhibitory capacity were correlated from studies of families, rural populations, and hospital patients. The results did not support the hypothesis that intermediate serum antitrypsin deficiency or the heterozygous deficiency state predispose to obstructive lung disease.

71-0444. Higgins, I.T.T., Higgins, M. W., Gilson J. C., Campbell, H., Waters, W. E., Ferris, B. G. **Smoking and Chronic Respiratory Disease: Finding in Surveys Carried Out in 1957 and 1966 in Staveley in Derbyshire, England.** *Chest* 59(5, Supplement):34S-35S, May 1971.

A nine year follow-up survey of chronic respiratory diseases to one conducted in 1957 was undertaken to investigate the changes in lung function over the years, and the rate of development or remission of symptoms in relation to smoking habits. Among the four occupational groups studied, three were engaged in dusty jobs, such as mining and foundry work. The results of this second survey of 878 males (ages 25-74) showed, over the nine year period, a consistent relationship of smoking to persistent cough and sputum; however, inconsistencies were found within the age groups in regard to lung function due partly to the confounding occupational effect. A high proportion of smokers developed symptoms, while the majority of nonsmokers and ex-smokers were relieved of them. The proportion of smokers who died from all causes was almost double that of the nonsmokers. There was a progressive increase (ages 55-64) in the proportion who died with: (1) an increase in the prevalence of symptoms reported in 1957; (2) an increase in breathlessness grade; and (3) a decrease in FEV.

71-0445. Islam, M. S., Datta, P. K., Mitra, D. K., Chakraborty, M. K. **Changes of Ventilatory Function Amongst Smokers and Non-Smokers.** *Indian Journal of Physiology and Pharmacology* 14(3):165-173, July 1970.

The effects of cigarette smoking on lung functions of 32 male Indians. 18 smokers and 14 nonsmokers, were observed. Observations were made on the same subjects once in 1963-64 and then again in 1969 and the relative deterioration in lung function of the two groups during this period was compared. The lung function tests included forced vital capacity (FVC), forced expiratory volume for one second ($FEV_{1.0\ sec}$) and mean maximal expiratory flow between 50-75 percent ($MMEF_{50\text{-}75\ percent}$). The long term effects of smoking showed a reduction in both FVC and $FEV_{1.0\ sec}$ over a period of 5 years. The reduction in FVC was more than $FEV_{1.0\ sec}$ among the smokers, whereas the reduction of $FEV_{1.0\ sec}$ was more than the FVC among the nonsmokers. Diurnal variation in lung functions showed greater declines of FVC, $FEV_{1.0\ sec}$ and $MMEF_{50\text{-}75\ percent}$ in smokers than those in nonsmokers; the declines in $FEV_{1.0\ sec}$ and $MMEF_{50\text{-}75\ percent}$ were more in comparison to FVC within the smoker group. The immediate effect of smoking a cigarette was slight decrease in $FEV_{1.0\ sec}$ and $MMEF_{50\text{-}75\ percent}$ both of which tended to return to pre-smoking values after 10 minutes of smoking and almost returned to that level in another 20 minutes. There was no significant change in FVC after smoking.

71-0446. Jancik, E. **Quelques Donnees et Correlations Provenant d'une Etude Epidemiologique sur l'Incidence des Symptomes Caracteristiques des Maladies Respiratoires Chroniques Non Specifiques. [Some Facts and Correlations From an Epidemiologic Study on the Incidence of Symptoms Characteristic to Chronic Non-Specific Lung Diseases.]** *Revue de Tuberculose et de Pneumologie* 34(5):749-752, July-August 1970, French.

Additional facts and correlations which complement a previously published epidemiologic study of chronic nonspecific lung diseases are reported. A significant correlation was found between the number of cigarettes smoked per day and the presence of cough and expectoration during three months per year. A negative correlation of daily consumption with age indicated that younger men smoke more cigarettes per day than older men. In five age groups, 40-44, 45-49, etc. up to 60-64, the percentage of subjects with dyspnea increased with age in nonsmokers from 4-12 percent, in smokers consuming 25 cigarettes per day or more, from 10-24 percent, and in ex-smokers, from 7-25 percent. Differences in nonsmokers and heavy smokers (including ex-smokers) clearly indicate that the quantity of tobacco consumed is a factor linked to dyspnea independent of age. Other correlations reported concern air pollution and occupations, radiological signs and characteristic symptoms of chronic nonspecific lung diseases, and the probable influence of hereditary or genetic factors on said diseases.

71-0447. Kaatzsch, H. **The Influence of Smoking on the Ventilatory Disturbance in Bronchitis.** Complete English translation of *Medizinische Klinik* 64(47):2196-2199, November 21, 1969.

See Abstract 70-0133.

71-0448. Kallqvist, I., Taube, A., Olafasson, O. **Peak Expiratory Flow in Healthy Persons Aged 45-65 Years.** *Scandinavian Journal of Respiratory Diseases* 51(3):177-187, 1970.

The peak expiratory flow (PEF) test was included in a health survey in a Swedish industrial town to obtain PEF values which could be used as predicted normal readings. Since the conditions of the study did not permit a full analysis of the effects of cigarette smoking, an unknown number of asymptomatic smokers were included in the "normal" group. However, the PEF readings showed no discernible difference between asymptomatic smokers and the total "normal" series. The results showed a strong correlation between PEF and sex, age and body height.

71-0449. Komitzer, M., Demeester, M. **La Symptomatologie Respiratoire en Epidemiologie. Resultats de l'Enquete Effectuee Dans une Banque Bruxelloise. [Respiratory Symptomatology in Epidemiology. Results From a Survey Effected in a Bank in Brussels.]** *Acta Tuberculosea et Pneumologica Belgica* 61(5/6):481-506, September-December 1970, French.

The prevalence of respiratory symptoms related to chronic respiratory diseases was studied in a population of 539 male bank clerks aged from 40 to 59 in Brussels. The study included the use of a peak flow meter and a questionnaire covering such symptoms as cough, expectorations, and shortness of breath as well as each individual's smoking history and habits. Data collected indicating a relationship between respiratory symptoms, peak expiratory flow measurements, and smoking habits are statistically presented. Cigarette smoking seems to be related to certain symptoms of chronic bronchitis as well as to reduced peak flow.

71-0450. Kucewicz, J. **Chronic Nonspecific Respiratory Diseases in the City of Cracow. VIII. Fisher's Discriminant Function in the Analysis of the Influence of Smoking on Prevalence of Symptoms.** *Epidemiological Review* 23(1/2):159-165, 1969.

The applicability of Fisher's discriminant function analysis to determine the relation between three characteristics of smokers and disease symptoms was tested. A questionnaire was designed to provide information about three characteristics: period of smoking in years, age at time of starting smoking, and number of cigarettes smoked daily recently. The influence of each factor on the occurrence of symptoms of chronic bronchitis was analyzed indicating that the number of cigarettes smoked daily had the greatest influence. From an interview of 80 "present smokers", 50 percent reported cough and/or phlegm production.

71-0451. Manu, P., Dumitriu, M., Ghise, O., Comanescu, C. **Cercetari Epidemiologice Privind Bronsita Cronica la un Lot din Populatia Generala a Orasului Bucuresti. [Epidemiological Studies on Chronic Bronchitis in a Sample of the General Population of Bucharest.]** *Medicina Interna* 22(9):1123-1134, September 1970, Romanian.

Research was conducted on the occurrence and distribution of chronic bronchitis from May 1968 to May 1969 on a sample of the urban population of Bucharest. The sample consisted of 380 men and 620 women, ages 30-69. The largest number of chronic bronchitic cases was found in the 284 subjects of the 60-69 age group. The ratio of bronchitics to the total population was studied and etiological factors were considered to determine if smoking was a direct, or at least a predisposing factor in chronic bronchitis. The incidence of chronic bronchitis was 17.3 percent of the total population studied. Of this group 42 percent of the men and 31 percent of the women who smoked had the disease. In ex-smokers, 30.5 percent of the men and 4.7 percent of the women had chronic bronchitis. The critical age for chronic bronchitis was 40-49 for men and 60-69 for women.

71-0452. Pavia, D., Thomson, M. L., Pocock, S. J. **Evidence for Temporary Slowing of Mucociliary Clearance in the Lung Caused by Tobacco Smoking.** *Nature* 231(5301):325-326, June 4, 1971.

Twenty-two volunteers (ages 64-92), of whom 19 were cigarette smokers and 2 pipe smokers, were studied to determine the acute effects of smoking on mucociliary clearance. Ventilatory capacity tests revealed eight subjects with mild restrictive impairment and two with airway obstruction. Subjects were asked to smoke from two to five cigarettes consecutively with no time constraint. The rate of mucociliary clearance was determined by gamma ray counting at frequent intervals following inhalation of tracer particles. In comparing the effects of smoking on the clearance curves, subjects with restrictive impairment had a larger difference than the normal group. Student's *t* tests on the clearance slopes of subjects before and during smoking showed significant slope changes in 4 of 12 normals and in 6 of 8 restrictive subjects. Of these ten subjects, nine were cigarette smokers and the other a pipe smoker. The average product of tobacco consumption and the time of smoking was 109 g-min for the 10 subjects who showed a significant slope change as compared to 58 g-min for the 12 subjects with a non-significant slope change.

71-0453. Pavlik, I., Cermakova, Z. **Early Skin Reaction Against Tobacco Extract in Respiratory System Disease.** Complete English translation of "Casna Kozni Reakce na Tabakovy Extrakt u Chorob Dychadel", *Rozhledy v Tuberkulose a v Nemocech Plicnich* 24(9):629-635, 1964.

A total of 834 patients, both smokers and nonsmokers, suffering from bronchial asthma and chronic inflammatory disorders of the respiratory passages were studied. Investigation revealed a highly significant increased frequency of positive skin tests against tobacco extract in smokers, regardless of whether asthma was present or absent. These results favor the hypothesis that allergization participates not only in the origin of bronchial asthma in smokers, but in the origin of chronic bronchitis as well. Results obtained by other researchers provide evidence for the participation of allergization in the origin of some other disorders, also connected with smoking. In this way allergy assumes the position of a true connecting link between a great number of diseases, connected stochastically with smoking.

71-0454. Peabody, H. D. (Jr.), Wilson, J. K. **Epidemiologic Factors in Etiology of Chronic Respiratory Disease.** *Chest* 59(5, Supplement):31S-32S, May 1971.

A statistical analysis of potential risk factors leading to obstructive pulmonary disease has been made on 251 men from the San Diego Fire Department examined yearly for nine years. Results of pulmonary function evaluation and correlation with risk factors have been presented. In descending order of severity the factors appear to be cigarette smoking, history of pulmonary infection, death of one or both parents, history of allergy, family history of respiratory abnormalities and occupational hazard prior to employment with the San Diego Fire Department. There was no significant difference between the levels of pulmonary function and the degree of present occupational exposure. (Auth. Abs. Mod.)

71-0455. Pregowski, V., Brysiewicz, K., Cesarz-Fronczyk, M., Kordecka, J., Leszcbinski, B., Lukjan, Z., Sadokierska, H. **La Bronchite Chronique Parmi les Ouvriers d'une Usine Textile. Depistage Clinique et Radiologique. [Chronic Bronchitis Among Textile Workers. Clinical and Radiological Detection.]** *Revue de la Tuberculose et de Pneumologie* 34(5):753-755, July-August 1970, French.

In a study of 1,047 textile factory workers in Bialystok, Poland, the incidence of chronic bronchitis was found to be dependent upon working condition (the degree of dust polluton) and work location. This incidence was greater in cigarette smokers. In addition to clinical detection, radiological detection methods permitted finding not only previously unknown tuberculosis cases and cancer cases at an early stage of development, but also advanced bronchitis, emphysema, and bronchiectasis. Radiological plates taken in profile position while inhaling and exhaling, were also quite useful in the detection of these diseases.

71-0456. Randowa, D., Niewiadomska, S., Paslawska-Prus, J., Mos, R., Rzeszutko, B., Wozniak, J. **Obraz Epidemiologiczny Przewleklych Nieswoistych Chorob Pluc Ludnosci Jednigo Rejonu Miasta Wroclawia. [Epidemiological Picture of Chronic Nonspecific Lung Diseases in One District of the City of Wroclaw.]** *Gruzlica i Choroby Pluc* 38(7):585-594, 1970, Polish.

The incidence and occurrence of chronic, nonspecific pulmonary diseases in one district of Wroclaw, Poland, were investigated. A total of 1466 persons (823 women and 643 men) over age 40 were examined (47 percent of the population of the survey). Methodology for study included mass miniature radiography, spirometry, and questionnaire techniques. Chronic bronchitis was found in 11 percent of the women and in 21 percent of the men examined. The higher percentage in men is accounted for by their habit of smoking tobacco and its products. Dyspnea and a decreased vital capacity, as shown by spirometric examination, were more often observed in women than in men, but this is thought to be due to obesity in women. Emphysema was diagnosed by X-ray in 2 percent of the women and in 4 percent of the men tested. The statistical evaluation showed that it was cigarette smoking which brought about a greater incidence of the various diseases. Smoking as such, for example pipe smoking in men, could not always be clearly identified statistically as the causative agent. This in part is accounted for by the methods of statistical interpretation.

71-0457. Saha, N. C., Jain, S. K. **Chronic Obstructive Lung Disease in Delhi. A Comparative Study.** *Indian Journal of Chest Diseases* 12(1/2):40-51, January-April 1970.

Using a standardized questionnaire and laboratory investigations in non-specific lung disease in Delhi, clinicophysiologic observations were compared with similar observations previously reported from London and Chicago. There were close similarities in the clinical, radiological and physiological features of the disease in the three groups, but certain differences were also observed. Sixteen percent of the Delhi patients were nonsmokers whereas almost all of the London and Chicago groups were smokers. Delhi patients had more productive cough, slightly less severe degree of airway obstruction and emphysema, less severe degree of blood gas disturbances, and less frequent incidence of acute chest infection with pyogenic organisms.

71-0458. Sanders, C. L., Jackson, T. A., Adee, R. R., Powers, G. J., Wehner, A. P. **Distribution of Inhaled Metal Oxide Particles in Pulmonary Alveoli.** *Archives of Internal Medicine* 127(6):1085-1089, June 1971.

The phagocytic response of alveolar cells is a significant factor in determining the pulmonary distribution and fate of inhaled, insoluble particles. The type I alveolar epithelium and alveolar macrophage readily phagocytized inhaled nickel monoxide and chromic oxide particles with 80 percent and 91 percent, respectively, of alveolar deposits being found in macrophages and 0.5 percent and

4.2 percent, respectively, being localized in type I alveolar epithelium. Type II alveolar epithelium did not exhibit any phagocytic activity. Fewer NiO particles were found in macrophages, and more were found free in alveolar lumens following exposure to cigarette smoke, indicating an inhibition of phagocytosis of inhaled particles by cigarette smoke. (Auth. Abs.)

71-0459. Seely, J. E., Zuskin, E., Bouhuys, A. **Cigarette Smoking: Objective Evidence for Lung Damage in Teen-Agers.** *Science* 172(3984):741-743, May 14, 1971.

High school students with one to five years' smoking experience have excessive cough, sputum production, and shortness of breath. When maximum expiratory flow is plotted against maximum expired volume, the curves of nonsmokers and smokers differ in shape. The smokers have lower flow rates at mid-vital capacity and at lower lung volumes. This probably reflects small airway obstruction in the smokers. (Auth. Abs.)

71-0460. Snider, G. L., Doctor, L., Demas, T. A., Shaw, A. R. **Obstructive Airway Disease in Patients With Treated Pulmonary Tuberculosis.** *American Review of Respiratory Disease* 103(5):625-640, May 1971.

Data were collected just before medically approved sanitorium discharge from 1,403 patients with pulmonary tuberculosis using a questionnaire, the hospital chart, a spirogram, and a rating of chest roentgenograms. Pulmonary tuberculosis was moderately advanced at discharge in 52 percent of patients and far advanced in 21 percent; 87.5 percent of patients had no tubercle bacilli in their sputum cultures for more than two months before the study. Approximately 75 percent of men and more than 40 percent of women were current cigarette smokers. Airway obstruction, defined as diminution of forced expiratory volume in one second to less than 70 percent of vital capacity, was found in 62 percent of white men, 37 percent of nonwhite men, 36 percent of white women, and 17 percent of nonwhite women. Cough, expectoration, severe dyspnea, and wheezing during most days and nights paralleled spirometric evidence of airway obstruction and were also more prevalent in whites than nonwhites. Airway obstruction was present more often in men than in women but in both sexes was less prevalent in the younger, lighter smoking patients with less severe tuberculosis. The addition of any one factor such as older age, more smoking, or more severe tuberculosis caused a twofold or greater increase in prevalence of airway obstruction; the increase was least for heavier smoking. The coincidence of any two of these factors resulted in a quadrupling of the prevalence of airway obstruction. Addition of the third characteristic had little further effect. The nonwhites were younger, smoked fewer cigarettes per day, and had less extensive residual changes in their radiographs. The lower prevalence of residual respiratory symptoms and airway obstruction was therefore not attributed to race. (Auth. Abs.)

71-0461. Stephens, R. J., Freeman, G., Evans, M. J. **Ultrastructural Changes in Connective Tissue in Lungs of Rats Exposed to NO_2.** *Archives of Internal Medicine* 127(5):873-883, May 1971.

Striking alterations in both collagen fibrils and basement membranes were revealed with the electron microscope in the lungs of rats exposed to subacute levels of nitrogen dioxide. Collagen fibrils underlying the terminal bronchiole in control rats increase slightly in size with age, and may appear stellate in cross section during old age. In marked contrast, young animals exposed to 17 ± 2 ppm for three months develop very large fibrils up to 15 times the normal diameter. The same response was observed in animals exposed to 2 ± 1 ppm for two or more years. The basement membrane under the epithelium of the terminal bronchiole also becomes greatly thickened. These alterations are seen after exposure to NO_2 at subacute levels that endure neither edema nor significant destruction of cells but cause viable tissue to undergo metabolic alterations reflected by the changes described. Similar responses in dogs due to cigarette smoking have been reported. (Auth. Abs. Mod.)

71-0462. Sterling, T. D. **Comment on Smoking Dogs. (Letter)** *Archives of Environmental Health* 22(5):631-632, May 1971.

The experiment described in the article by Hammond, Auerbach, et al, "Effects of Cigarette Smoking on Dogs," is criticized for having allowed the lungs of the dogs to be infused with unfiltered air drawn directly through holes in the trachea and so bypassing the usual protective mechanisms which remove dust and other impurities that reportedly have caused changes in lung tissue, including true metastatic cancers. In addition, there were no controls subjected to comparable treatment but without exposure to cigarette smoke.

71-0463. Velican, C. **Cercetari Privind Mechanismele Aparitiei Emfizemului Pulmonar la Tabagici. [Mechanisms of Pulmonary Emphysema in Heavy Smokers.]** *Studii si Cercetari de Medicina Interna* 11(6):455-468, 1970, Romanian.

The macromolecular organization of the surfactant, the ground substance, the basal membranes and the reticulin, collagen and elastic fibers in the alveolar walls is progressively altered by the action of chronic heavy smoking, though the lung continues to show for a long time an apparently normal aspect to usual techniques. Periodic association of lower air passage infections enhances the severity and extent of these alterations precipitating the occurrence of lesions that can be revealed by hematoxylin and eosin staining. The action of tobacco smoke determines in a first stage an increase of intermolecular bonds, this process of "tanning" *in vivo* decreasing the elasticity and extensibility of the alveolar wall which thus breaks more easily on various functional demands. Secondary infections lead to release of lysosomal enzymes from infiltration cells as well as to enzymes elaborated by microorganisms. There results a predominance of degrading processes favoring the rupture of alveolar walls and the occurrence of emphysema. Particular stress is laid on the presence of a correlation between the number of inflammatory cells in the alveolar wall and the intensity of the degenerative processes that may be detected in these structures. (Auth. Abs.)

71-0464. Voisin, C. **Les Facteurs Etiologiques Dans la Bronchite Chronique et L'Emphyseme Pulmonaire. [Etiologic Factors in Chronic Bronchitis and Pulmonary Emphysema.]** *Revue de Medecine* 11(37):2175-2179, October 29, 1970, French.

A large number of factors are responsible for chronic bronchitis and emphysema. The effects of these factors overlap making it difficult to assess the relative responsibility of each. However, investigations into the epidemiology of these disorders carried out over the past few years have established the determining role of nicotinism and air pollution, and to a lesser degree that of substances of a professional nature. These exogenous factors are all the more dangerous when they exercise their effects on a constitution predisposed by endogenous factors: allergy, genetic disorders, chronic infections of the respiratory tract. The knowledge of these facts is the indispensable basis for effective prevention of chronic bronchitis and emphysema. The dominant feature in this prophylaxis should be the fight against nicotinism and air pollution. (Auth. Abs.)

71-0465. Wilhelmsen, L. **Harmful Clinical Effects of Smoking. Smoking and the Upper Respiratory Passages.** Complete English translation of "Medicinska Skadeverkningar av Rokning. Rokning och Ovriga Luftvagssjukdomar", *Social-Medicinsk Tidskrift* 2(Special No.):73-77, February 1971.

The effects of tobacco smoking on the lungs can be divided into an acute effect that primarily involves spasms of the air passages and changes in surface tension of the alveoli, and a chronic effect that involves changes in mucous production in the air passages and an increased tendency toward infection. These changes lead to impaired pulmonary function and an increased tendency to chronic bronchitis as shown by a number of epidemiological studies.

See also, **71-0413, 71-0421, 71-0429, 71-0434**

CARDIOVASCULAR DISEASES

71-0466. Ander, S., Tibblin, G., Wilhelmsen, L. **Points in the Matter of Giving Up Smoking. Who Stops Smoking After Acute Myocardial Infarct?** Complete English translation of "Synpunkter pa Rokavvanjning. Vem Slutar Roka Efter Akut Hjartinfarkt?", *Social-Medicinsk Tidskrift* 2(Special No.):120-123, February 1971.

Factors that have significance for the possibility of infarct patients to stop smoking are discussed. Factors favorable to stop smoking were severe infarct and first instance of infarct. Patients who had previously received tranquilizers and those who had difficulty sleeping at night had greater difficulty in giving up smoking. Certain attitudes toward smoking also appear to influence the outcome.

71-0467. Aronow, W. S., Dendinger, J., Rokaw, S. N. **Heart Rate and Carbon Monoxide Level After Smoking High-, Low-, and Non-Nicotine Cigarettes. A Study in Male Patients With Angina Pectoris.** *Annals of Internal Medicine* 74(5):697-702, May 1971.

Ten cigarette smokers with angina pectoris had blood pressure, heart rate, and expired-air carbon monoxide measurements before and after smoking each of five high-, low-, and non-nicotine cigarettes. There was a significant increase in systolic and diastolic blood pressure after smoking each high- and low-nicotine cigarette, with a significant increase in peak systolic and diastolic blood pressure from cigarette 1 to cigarette 5. There was a significant increase in heart rate after smoking each high- and low-nicotine cigarette but no significant increase in peak heart rate from cigarette 1 to cigarette 5. There was no significant increase in blood pressure or heart rate after smoking a non-nicotine cigarette. There was a significant increase in carbon monoxide level after smoking each high-, low-, and non-nicotine cigarette, with a significant increase in peak carbon monoxide level from cigarette 1 to cigarette 5. (Auth. Abs.)

71-0468. Astrup, P., Kjeldsen, K., Wanstrup, J. **The Effects of Exposure to Carbon Monoxide, Hypoxia and Hyperoxia on the Development of Experimental Atheromatosis in Rabbits.** In: Jones, R. J. (Editor). *Atherosclerosis. Proceedings of the Second International Symposium.* Chicago, November 2-5, 1969. New York, Springer-Verlag, 1970, pp. 108-111.

The following experiments were conducted: 1) cholesterol-fed rabbits were exposed to a carbon monoxide (CO)-containing atmosphere for 10 weeks, causing a 15-20 percent carboxyhemoglobin (COHb) concentration; 2) cholesterol rabbits were exposed to a 10 percent oxygen atmosphere for 8 weeks; 3) cholesterol-fed rabbits were exposed to a 28 percent oxygen atmosphere for 10 weeks; 4) rabbits fed a normal diet were exposed to a CO-containing atmosphere for 13 weeks, causing an 11 percent COHb concentration. Tissue cholesterol in the CO-exposed rabbits was 2.5 times greater than in controls. In hypoxic animals, this difference in cholesterol deposition was even more pronounced. Triglycerides in aortic tissue were significantly increased in both CO-exposed and hypoxic animals, while phospholipids showed only minimal and nonsignificant changes compared to controls. Aortic cholesterol content in the hyperoxic group was only half of that in controls. Both macroscopically and microscopically, it was easy to differentiate experimental from control animals. The hypoxic group showed a deep transmural lipid infiltration of the vascular wall causing a prominent interstitial xanthomatosis in the perivascular structures. In the rabbits fed a normal diet and exposed to small CO concentrations, multifocal vascular damage of the early arteriosclerotic type was found. Other autopsy findings included the frequent occurrence of exudate in the serous cavities, especially in CO-exposed animals. Apart from quantitative differences, changes in the CO-exposed and hypoxic groups were identical.

71-0469. Branemark, P.-I. **Smoking and Coronary Disease (13): Microvascular Effects.** Complete English translation of *Lakartidningen* 67(3):266-271, January 14, 1970.

See Abstract 70-0627.

71-0470. Brewer, G. J., Eaton, J. W., Grover, R. F., Weil, J. V. **Cigarette Smoking as a Cause of Hypoxemia in Man at Altitude.** *Chest* 59(5, Supplement):30S-31S, May 1971.

Carboxyhemoglobin levels of smokers in Leadville, Colorado (altitude 3100 meters) were significantly higher than in smokers near sea level. Oxygen pressure in arterial blood (PaO_2) was significantly lower in Leadville smokers than in nonsmokers. In 8 of 10 smokers who abstained from smoking for 24 hours, PaO_2 increased to levels equivalent to those of nonsmokers. The hemoglobin oxygen affinity of Leadville smokers was slightly increased compared to sea level normal values and was most increased in individuals with hematocrits over 56 percent. Total red cell mass was higher in smokers compared with nonsmokers. These results indicate that cigarette smoking may produce pronounced limitations on oxygen transport at high altitude and may restrict one's ability to adapt to the reduced oxygen tensions.

71-0471. Carver, S. T. **Ecology of Coronary Heart Disease.** *New York State Journal of Medicine* 71(10):1065-1070, May 15, 1971.

The possible influence of external or internal environment on the pathogenesis of coronary heart disease forms the basis of this study. Risk factors in relation to internal environment, such as genetic abnormalities, body build, hypertension, personality type, and elevation of serum cholesterol are considered. The effect of man's external environment on the development of coronary heart disease includes a consideration of smoking, diet, stress, climate, impurities in inhaled air, and physical activity. However, it is stressed that the pathophysiologic processes which determine the subsequent risk is established early in life and that future investigations of the genesis and prevention should be centered more on the periods of childhood and adolescence. (Auth. Abs. Mod.)

71-0472. Ceia, F., Lopes, M. G., Barros, F. B. **Micrometodo de Astrup. Valores Normais de pH, PCO_2, Bicarbonatos Standard e Excesso de Base no Sangue Capilar. [Micromethod of Astrup. Normal Values of pH, PCO_2, Standard Bicarbonates and Base Excess in Capillary Blood.]** *Jornal da Sociedade das Ciencias Medicas de Lisboa* 135(1):55-63, January 1971, Portuguese.

The results of a study of pH, PCO_2, standard bicarbonates and base excess levels in the capillary blood of 23 normal individuals of both sexes, ages 21-30, showed that: 1) pH values are significantly different in smoking and nonsmoking males, being higher in smokers, and for females the values are identical to those for nonsmoking males; 2) PCO_2 values are significantly lower in females; and (3) there are no significant differences between sexes as regards standard bicarbonates and base excess.

71-0473. Elmfeldt, D. **Smoking and Coronary Disease (8): Smoking Habits of Heart Infarct Patients.** Complete English translation of *Lakartidningen* 67(2):168-169, January 7, 1970.

See Abstract 71-0120.

71-0474. Elwood, P. C. Hughes R. E., Hurley, R. J. **Ascorbic Acid and Serum-Cholesterol. (Letter)** *Lancet* 2(7684):1197, December 5, 1970.

If plasma ascorbic acid, which is lowered by smoking, is involved in cholesterol metabolism, a raised prevalence of arteriosclerosis in heavy smokers might result. A study of 254 normal women, including 154 nonsmokers and 100 smokers, in a Welsh mining valley showed a decrease in plasma ascorbic acid with increased cigarette consumption, but no evidence of a significant association between plasma ascorbic acid and serum cholesterol.

71-0475. Erwin, C. W. **Cardiac Rate Responses to Cigarette Smoking: A Study Utilizing Radiotelemetry.** *Psychophysiology* 8(1):75-81, January 1971.

Radiotelemetry of the human EKG was obtained to observe for rate alterations during spontaneous cigarette smoking. Ten subjects were observed for a total of 26 hours during which time 50 cigarettes were smoked. The utilization of telemetry allowed the subjects to continue their usual afternoon behavior. There were no rate changes before, during, or after smoking which could be attributed to the cigarette. These results differ from most previous reports. Telemetry allows for two departures from past designs; subjects were ambulant and smoking behavior was spontaneous (both in initiation and rate). It is suggested that these departures are related to the results of the present study. (Auth. Abs.)

71-0476. Fodor, J. **Smoking and Coronary Disease (4): The Prague Study.** Complete English translation of *Lakartidningen* 67(2):150-152, January 7, 1970.

See Abstract 71-0122.

71-0477. Guenter, C. A., Welch, M. H., Hammarsten, J. F. **Alpha$_1$- Antitrypsin Deficiency and Pulmonary Emphysema.** *Annual Review of Medicine* 22:283-292, 1971.

This review summarizes the available information regarding the characteristics of serum proteinase inhibitors, the incidence and type of pulmonary disease association with familial alpha$_1$- antitrypsin deficiency, and the evidence that pulmonary tissue injury may be related to the deficiency of these inhibitors.

71-0478. Harland, W. A. **The Problems of Atherosclerosis.** *Practitioner* 206(1233):312-329, March 1971.

A review of the anatomy, epidemiology, pathogenesis, risk factors, and treatments of atherosclerosis is given. Emphasis is primarily on the numerous risk factors that aggravate this disease. Studies show that serum cholesterol, high blood pressure, and cigarette smoking have a direct relationship; that physical activity and environmental temperature have inverse relationships; and that soft water and genetic factors give no evidence of a relationship with atherosclerosis. The cumulative effect of all these factors is also discussed.

71-0479. Hess, H. **Smoking and Arterial Circulatory Disturbances of the Extremities.** Complete English translation of "Rauchen und arterielle Durchblutungsstorungen der Extremitaten", from: Schievelbein, H. (Editor). *Nikotin: Pharmakologie und Toxikologie des Tabakrauches.* Stuttgart, West Germany, Georg Thieme Verlag, 1968, pp. 193-198.

Various studies on the relationship between smoking and Raynaud's disease, acute inflammatory arterial diseases, and chronic obliterating vascular diseases are reviewed. Smoking appears to be only one factor in the genesis of obliterating vascular diseases. This is supported by the fact that this disease has been observed in nonsmokers, children and horses; that the majority of smokers do not contract the disease; that men are more prone to attack by the disease; and that there is no correlation between the degree of smoking and the incidence or severity of the disease. Smoking plays no role in the pathogenesis of Raynaud's disease and its only connection with acute inflammatory vascular diseases would have to be through an allergic process, but there have been no reports on this to date. Abstention from smoking is recommended as the basis of treatment for the obliterating vascular diseases.

71-0480. Jacobs, D. **The Aetiology and Possible Prevention of Myocardial Infarction.** *South African Medical Journal* 45(11):275-279, March 13, 1971.

The subjects of this study were 250 cases of myocardial infarction treated personally. Despite lack of proof that the relationship is causal there is a clear association with obesity, excessive cigarette smoking, hypertension, emotional stress, hyperuricemia and in qualified groups hyperlipidemia. Until the etiology of myocardial infarction has been clarified, it would appear reasonable to treat these factors so as to perhaps afford potential myocardial infarction sufferers some prophylaxis. Indirect clinical evidence is presented, which, correlated with the structural chemical similarities between cholesterol, sex hormones, vitamin D_3 and cortisone, suggests that future research be guided along these lines in the hope that a common denominator will eventually be discovered. (Auth. Abs.)

71-0481. Jones, R. J. (Editor) **Atherosclerosis. Proceedings of the Second International Symposium. Chicago, November 2-5, 1969.** New York, Springer-Verlag, 1970, 706 pp.

This symposium provides an up-to-date review of the pathogenic processes involved in atherosclerosis and of the proposals that have been made for their control. Included are sections on the basic pathogenesis of atherosclerosis; arterial thrombosis and its resulting complications; epidemiological considerations in coronary heart disease from around the world; nutritional studies relating to atherosclerosis; newer knowledge about the serum lipoproteins and the regulation of lipid metabolism, both sterols and triglycerides; consideration of prophylactic as well as drug therapy directed against pathogenic mechanisms; and a discussion of progress to date and future prospects of plans directed toward the control of atherosclerosis.

71-0482. Kjeldsen, K. **Carboxyhemoglobin and Serum Cholesterol Levels in Smokers Correlated to the Incidence of Occlusive Arterial Disease.** In: Jones, R. J. (Editor). *Atherosclerosis. Proceedings of the Second International Symposium.* Chicago, November 2-5, 1969. New York, Springer-Verlag, 1970, pp. 378-381.

A population of 1000 industrial workers, half of whom were tobacco workers, were investigated for carboxyhemoglobin and serum cholesterol levels and the relation of these values to smoking values and clinical signs of cardiovascular disease. Of the 59 subjects diagnosed as having atherosclerotic cardiovascular disease, 3 were light smokers, 34 were moderate smokers and 20 were heavy smokers. Average carboxyhemoglobin values were 6-8 percent in diseased subjects as compared to 3-4 percent in controls. There was also a highly significant difference in serum cholesterol values between these two groups. Healthy smokers had significantly higher serum cholesterol levels than nonsmokers, while no such difference was present in diseased subjects. Both carboxyhemoglobin and serum cholesterol concentrations increased with the intensity of smoking, suggesting a positive correlation between carboxyhemoglobin and serum cholesterol values. Tobacco workers had significantly higher carboxyhemoglobin and serum cholesterol values than other workers.

71-0483. Kjeldsen, K. **Smoking and Coronary Disease (12): Carbon Monoxide Exposure and Frequency of Atherosclerosis.** Complete English translation of *Lakartidningen* 67(3):262-265, January 14, 1970.

See Abstract 70-0639.

71-0484. Liljefors, I. **Smoking and Coronary Disease (7): Smoking Habits and Coronary Disease in a Twin Study.** Complete English translation of *Lakartidningen* 67(2):161-164, January 7, 1970.

See Abstract 71-0127.

71-0485. Mathiesen, F. R. **Rationelle Forholdsregler for Patienter med Kredslobslidelse i Benene. [Rational Measures for Patients With Vascular Insufficiency of the Legs.]** *Ugeskrift for Laeger* 132(41):1916-1919, October 8, 1970, Danish.

Reconstructive surgery, when possible, is considered the best method of treating vascular insufficiency in the legs. Unfortunately, only about 20 percent of all patients with vascular insufficiency are suited for this treatment. Of all the medical and prophylactic measures which can be offered to the remaining 80 percent, only tobacco abstinence and walking exercises have been proven to be of significant prognostic value. These should be instituted instead of drug therapy which, at its best, is of doubtful benefit. Considerable evidence is also available on the importance of maintaining a normal hemoglobin level and avoiding minor injuries to the feet.

71-0486. Matts, S.G.F. **Coronary Thrombosis.** *British Journal of Clinical Practice* 24(12):545-547, December 1970.

The main causal factors in coronary thrombosis can be divided into three categories: pathological factors, physical activity, and psychological stress. Included in the first category are cigarette smoking which causes arterial damage, obesity, hypertension, hypercholesterolemia, atheroma and platelet abnormalities. A large step forward has been taken with the widespread adoption of cardiac monitoring and setting up of intensive care units. This has enabled the mortality rate of hospital patients to be cut around 10 percent and has provided a vast wealth of new information for analysis. Thus, more data will become available as to the predisposing causal factors and their relevant importance, leading to developments in prevention rather than cure of coronary thrombosis.

71-0487. Raf, L. E. **Harmful Clinical Effects of Smoking. Smoking and Diseases of the Peripheral Vessels.** Complete English translation of "Medicinska Skadeverkningar av Rokning. Rokning och Perifera Karlsjukdomar", *Social-Medicinsk Tidskrift* 2(Special No.):67-71, February 1971.

Of 98 patients admitted for surgery of the peripheral circulatory system (intermittent claudication), 94 had been smokers when their symptoms began. Of these 94, 68 were cigarette smokers averaging 15 cigarettes/day. Ages varied from 39-82, but almost half of the patients were in the 60-70 age group. Men strongly predominated (86 percent). Experiences from the Mayo Clinic are reviewed which suggest that tobacco withdrawal improves the prognosis for patients with intermittent claudication: of 87 patients who continued smoking, 10 had amputations while of 80 who stopped smoking, none had amputations. Because of the strong indications of the harmful effect of smoking on the peripheral circulation, patients with intermittent claudication must be strongly instructed to stop smoking.

71-0488. Schoendorf, T., Wilkening, J., Cliffton, E. E. **Influence of Cigarette Smoking on Some Blood Coagulation Tests.** *Journal of Medicine; Experimental and Clinical* 1(2):117-128, 1970.

The aim of this investigation was to study certain effects of cigarette smoking on the blood coagulation system. Twenty-seven habitual smokers took part one or more times in the study. Three types of cigarettes were used containing different nicotine concentrations in the mainstream smoke. Some alteration could be observed in the blood clotting system after smoking two standard cigarettes. A proportionate dose response in the blood clotting system to the differing nicotine concentration could not be demonstrated. (Auth. Abs.)

71-0489. Shields, C. E. **Elevated Carbon Monoxide Levels From Smoking in Blood Donors.** *Transfusion* 11(2):89-93, March-April 1971.

The greater affinity of hemoglobin for carbon monoxide than for oxygen can lead to increased carboxyhemoglobin in blood donors who smoke. The presence of carboxyhemoglobin has an adverse effect on the oxygen dissociation curve resulting in a decreased release of oxygen to the tissues. When this is present, along with the progressive decrease in oxygen-carrying capacity resulting from storage, bank blood will have an even greater loss in ability to provide oxygen to the tissues of a recipient. Carbon monoxide can be displaced from hemoglobin by oxygen when there is room air exchange by donor respiration. The rate of this exchange can be accelerated by taking advantage of the natural gas laws and using a higher concentration of oxygen for respiration or by increasing ventilatory exchange. Volunteers in the present study raised their carboxyhemoglobin levels by heavy smoking and had the rate of decrease in carboxyhemoglobin tested either after breathing pure oxygen or after exercise-induced hyperventilation. The decreases in carboxyhemoglobin levels were accelerated by either method. Donors who had not smoked showed low carboxyhemoglobin levels which did not decrease after exercise. Thus, blood banks could minimize carboxyhemoglobin levels in collected blood by restricting the smoking of donors, by not collecting blood for at least 2 to 4 hours after smoking, or by using oxygen breathing or exercise-induced hyperventilation to accelerate the donors excretion of carbon monoxide. (Auth. Abs.)

71-0490. Strong, J. P., Eggen, D. A. **Risk Factors and Atherosclerotic Lesions.** In: Jones, R. J. (Editor). *Atherosclerosis. Proceedings of the Second International Symposium.* Chicago, November 2-5, 1969. New York, Springer-Verlag, 1970, pp. 355-364.

Data from the International Atherosclerosis Project and other recent autopsy surveys are used to illustrate the association of risk factors for coronary heart disease to coronary atherosclerotic lesions. Coronary atherosclerosis is found to vary with age, sex, geographic location, and race. Lesions seems to be related to serum cholesterol and dietary fat when comparing populations, but insufficient data are available to confirm such associations on an individual basis within a population. Lesions are greater in hypertensive and diabetic individuals than in those without these conditions. Lesions are also greater in heavy cigarette smokers than in nonsmokers. No consistent association of atherosclerotic lesions is observed with physical activity or obesity. There is much variability in extent of coronary atherosclerosis among individuals of similar race, sex, age, geographic location, disease, and smoking habits. Thus, there are other important factors involved in development of atherosclerosis that have yet to be determined. (Auth. Abs.)

71-0491. Thiseus, S., Tibbling, L. **Smoking and Coronary Disease (9): Angina Pectoris or Angina Cardiae?** Complete English translation of *Lakartidningen* 67(2):165-167, January 7, 1970.

See Abstract 71-0139.

71-0492. Tibblin, G. **Harmful Clinical Effects of Smoking. Myocardial Infarct and Smoking.** Complete English translation of "Medicinska Skadeverkningar av Rokning. Hjartinfarkt och Rokning", *Social-Medicinsk Tidskrift* 2(Special No.):65-67, February 1971.

Smoking is a risk factor in the development of myocardial infarction in young and middle aged men. Of great etiological significance is the atherogenic effect of carbon monoxide. Judging from Japanese studies, among others, there are population groups that are heavy smokers with a low incidence of myocardial infarction. This suggests that in certain population groups there are factors which have a protective effect.

71-0493. Tibblin, G., Wilhelmsen, L. **Smoking and Coronary Disease (5): Men Born in 1913.** Complete English translation of *Lakartidningen* 67(2):153-155, January 7, 1970.

See Abstract 71-0140.

71-0494. Von Holst, H. E. **Smoking and Coronary Disease (1): Introduction.** Complete English translation of *Lakartidningen* 67(2):138-139, January 7, 1970.

See Abstract 70-0650.

71-0495. Wehrmacher, W. H. **Healing Waters and Healing Faith.** *Current Medical Dialog* 38(5):437-439, May 1971.

An epidemiological study of white men 45-65 years of age who died of arteriosclerotic and degenerative heart disease, was undertaken to determine if, as previously reported, the use of hard water reduced the natural incidence of chronic cardiovascular disease. History of smoking, educational levels, socioeconomic indices and patterns of living, such as church attendance were also recorded. Results showed fewer persons using soft water died from arteriosclerotic heart disease. Church attendence correlated best with reduction in the average death rate. The risk of fatal arteriosclerotic heart disease was greater among smokers than nonsmokers and was dose-related.

71-0496. Wilhelmsen, L. **Smoking and Coronary Disease (10): The Relationship Among Risk Factors in Coronary Disease.** Complete English translation of *Lakartidningen* 67(3):249-255, January 14, 1970.

See Abstract 70-0653.

71-0497. Zdichynec, B., Proks, C. **Vyznam Kuractvi Cigaret z Hlediska Infarktovych Zmen na Elektrokardiogramu. [Cigarette Smoking and Infarction Changes on the Electrocardiogram.]** *Casopis Lekaru Ceskych* 110(11):256-257, 1971, Czech.

An analysis of 637 cases of transmural myocardial infarctions (TIM) and intermediary coronary syndromes (ICS) showed a higher incidence of ICS and anteroseptal TIM among smokers. The development of ICS in younger males is not favorable from the prognostic aspect. Possible pathogenetic mechanisms which need experimental confirmation are discussed.

See also, **71-0355, 71-0356, 71-0360, 71-0368, 71-0370, 71-0377, 71-0386, 71-0390, 71-0399, 71-0405, 71-0410, 71-0421, 71-0449, 71-0502**

OTHER DISEASES AND CONDITIONS

71-0498. Chanial, G., Joseph, J., Colin, L., Duclaux, C. **Dermatitis in Tobacco Workers (Remarks on 9 Observations).** Complete English translation of *Bulletin de la Societe Francaise de Dermatologie et de Syphilographie* 77(2):281-283, July 1970.

See Abstract 70-1128.

71-0499. Cooper, K. H., Zechner, A. **Physical Fitness in United States and Austrian Military Personnel. A Comparative Study.** *Journal of the American Medical Association* 215(6):931-934, February 8, 1971.

The level of physical fitness of men, ages 18 to 29, in the U.S. Air Force and the Austrian Army was compared. A marked difference in endurance performance was observed on a 12-minute field test of running performance irrespective of the stage of training or the age, even though the Austrian soldiers weighed more and a comparable percentage of them smoked cigarettes. The results indicate that the 12-minute field test is a good substitute for the laboratory-determined maximal oxygen consumption if the subjects are well motivated. (Auth. Abs. Mod.)

71-0500. Dennish, G. W., Castell, D. O. **Inhibitory Effect of Smoking on the Lower Esophageal Sphincter.** *New England Journal of Medicine* 284(20):1136-1137, May 20, 1971.

Pressure in the lower esophagus, lower esophageal sphincter and gastric fundus was measured in six normal males, all chronic smokers, to determine the effect of smoking on lower esophageal sphincter pressure. In all subjects, sphincter pressure dropped within two or three minutes after smoking began and remained low until smoking stopped. Pressure levels also fell in two of three subjects smoking cigars and in one of two subjects smoking pipes. Apparently, the fall in sphincter pressure during smoking reduces the sphincter's effectiveness as a pressure barrier to gastroesophageal reflux and may explain the clinical association between smoking and heartburn.

71-0501. Fang, H. S., Liu, H. M. **The Influence of Smoking and Drinking on Binocular Depth Perception.** *Chinese Journal of Physiology* 20(4):271-277, 1970.

The binocular depth perception test was made on thirty-seven random healthy male Chinese, about half of them being medical students and the rest business and teaching staff. The Howard-Dolman depth of perception apparatus was employed for measuring the distance difference of depth perception, i.e., depth perception error. The interpupillary distance was also measured. Based upon the former two values the binocular parallactic angle was then computed. It was found that smoking of 1 or 2 cigarettes did not affect the score of depth perception test and binocular parallactic angle. On the other hand, 30 and 60 minutes after drinking of 1 ounce of scotch whiskey the depth perception error was significantly larger than that of the control reading. Such an amount of whiskey, however, had no appreciable effect on the binocular parallactic angle. The average control value of the depth perception error was 16.0 mm, the interpupillary distance 63.0 mm, and the binocular parallactic angle 5.9 seconds. These values are quite close to those of Americans. (Auth. Abs.)

71-0502. **Itil, T. M., Ulett, G. A., Hsu, W., Klingenberg, H., Ulett, J. A. The Effects of Smoking Withdrawal on Quantitatively Analyzed EEG.** *Clinical Electroencephalography* 2(1):44-51, January 1971.

Thirty-two young male chronic cigarette smokers were deprived of smoking for a 24-hour period. EEGs were recorded before deprivation, at the end of the 24-hour smoking deprivation period, and again immediately following the smoking of three cigarettes. The EEGs were examined by visual inspection, by digital computer period analysis, and by electronic frequency analysis. All three methods of EEG analysis demonstrated that at the end of a 24-hour period of smoking deprivation an increase in slow activity occurred, although the frequency bands differed depending on the method used. Only the frequency analyzer data showed changes at a statistically significant level. Ten minutes after the subjects were permitted to smoke three cigarettes a shift back toward the normal resting pattern was seen. These findings support the results of an earlier pilot study which showed a significant increase in slow wave activity following smoking deprivation and were interpreted as a typical EEG sign of decreased vigilance. These EEG changes and their reversibility support the content that smoking is a complex psychosomatic problem, analogous to drug addiction. (Auth. Abs.)

71-0503. Juchau, M. R. **Human Placental Hydroxylation of 3,4-Benzpyrene During Early Gestation and at Term.** *Toxicology and Applied Pharmacology* 18(3):665-675, March 1971.

Benzopyrene hydroxylase activity in human placental tissues was investigated during early gestation (8-16 wk) in order to determine whether cigarette smoking would produce increased hydroxylation capacity at this gestational stage. Particulate subfractions of term placental homogenates from women who smoked cigarettes during pregnancy exhibited relatively high levels of enzymatic activity. At 8-10 wk gestation, however, levels of enzymatic activity in homogenates of human placenta or fetal livers were undetectable regardless of maternal smoking habits. At 11-13 wk gestation, very low levels of hydroxylase activity were observed in placentas of smokers, and slightly higher levels were apparent in smoker placentas at 14-16 wk gestation. Hydroxylating capacity of placental homogenates from nonsmokers was not detected at 8–16 wk gestation. Steroids synthesized by human placental tissues, *i.e.* *c*-estradiol, estrone, and progesterone, markedly inhibited the placental-catalyzed hydroxylation of benzopyrene. Cholesterol, dehydroepiandrosterone, testosterone, and androstenedione, which serve as substrates for other placental mixed-function oxidase systems, however, exhibited comparatively minor inhibitory effects. Similar effects of these and other steroids (methyltestosterone and pregenolone) were observed on the placental hydroxylase of 3-methylcholanthrene pretreated rats. (Auth. Abs.)

71-0504. Kashinskas, R. Yu. **Chronic Pharyngitis and Allergy.** Complete English translation of *Vestnik Otorinolaringologii* 31(3):52-57, May-June 1969.

See Abstract 70-1130.

71-0505. Kreis, B., Peltier, A., Fournaud, S., Dupin-Girod, S. **Precipitation Reaction Between Certain Human Sera and Soluble Tobacco Extracts.** Complete English translation of *Annales de Medecine Interne* 121(4):437-440, April 1970.

See Abstract 70-1298.

71-0506. Miskiewicz, H. **Zwiazek Palenia Tytoniu z Chorobami Przewodu Pokarmowego. [Connection Between Tobacco Smoking and Digestive Tract Diseases.]** *Wiadomosci Lekarskie* 23(22):1991-1995, November 15, 1970, Polish.

Etiological aspects of the association of tobacco smoking with diseases of the alimentary tract are briefly discussed. Smokers in comparison to nonsmokers are more afflicted by certain diseases of the alimentary tract, but a distinction must be made between the incidence arising in the various portions of the tract. In a smoker, the oral cavity, the esophagus, the stomach, the duodenum, and the liver all show their individual proneness to develop certain diseases. The oral cavity will show slight disturbances (impairment of the taste sensations) but also greater disturbances (inflammations, leukoplakia, and cancer). The attack on the oral cavity is a fourfold one: the mechanical attack by particles, the hydrodynamic attack due to inhaling tobacco smoke, the thermal one due to the ingestion of hot smoke which may reach the mouth with a temperature as high as 60°C., and the chemical attack which is due to nicotine, carcinogens and other noxious ingredients in the smoke. The esophagus of smokers shows six times as high an incidence of cancer as in nonsmokers. The stomach, which may become afflicted by various diseases induced by smoking, will show signs of an impaired pepsin excretion and other enzymatic alterations.

71-0507. Mukherjee, S. K. **Some Observations on Peptic Ulcer (A Study of 500 Cases).** *Antiseptic* 67(11):841-849, November 1970.

A study of 500 patients with peptic ulcer at the Medical College Hospitals in Calcutta in 1965 and 1966 relates to the types of peptic ulcer, their clinically diagnosed features to warrant hospitalization, and their treatment on hospitalization. A variety of factors including age, sex, religion, dietary habits, smoking, psychological factors, blood groups, gastric acidity, blood-urea after bleeding episodes, parasitic infections, and associated diseases are statistically analyzed. Among the male patients, 86.7 percent were smokers.

71-0508. National Research Council. Committee on Maternal Nutrition. **Maternal Nutrition and the Course of Pregnancy.** National Academy of Sciences, Washington, D.C., 1970, 241 pp.

Current knowledge concerning the problems, practices and research on maternal nutrition and its effect on the course and outcome of pregnancy is reviewed. The report examines the epidemiology of human reproductive casualties in terms of biomedical, biosocial and psychobiological determinants of pregnancy outcome; normal physiological changes that occur during pregnancy; the various kinds of anemia encountered during pregnancy and the puerperium with emphasis on the roles of iron and folic acid in their prevention and treatment; and the role of nutrition in fetal growth and development, pregnancy in adolescence and the toxemias of pregnancy.

71-0509. Pettersson, F. **Harmful Clinical Effects of Smoking. Smoking and Gynecological–Obstetrical Condition.** Complete English translation of "Medicinska Skadeverkningar av Rokning. Rokning och Gynekologisk-Obstetriska Tillstand", *Social-Medicinsk Tidskrift* 2(Special No.):78-82, February 1971.

Even if a number of biological and social variables are taken into consideration, it remains that smoking women have offspring with lower birth weights. Thus far it has not been possible to detect any serious consequences of the reduced birth weight. In a multifactorial analysis, no increased risk of abortion in smoking mothers was found. Smoking women appear to have more pregnancies than nonsmoking women.

71-0510. Philips, C. **The EEG Changes Associated With Smoking.** *Psychophysiology* 8(1):64-74, January 1971.

Computer analysis of EEG data, recorded under both resting and work conditions following smoking, was compared to the appropriate control data in 6 male subjects. Following digitizing, a power spectra analysis was performed which revealed significant reductions in the peak alpha frequency component up to 20 minutes following smoking, during a visual task. Eyes open resting data showed a similar but not significant loss, after 8 minutes. No indications of increased fast activity were found. These results were related to comparable work on animals and humans. A suggestion was made as to the relevance of these changes. (Auth. Abs.)

71-0511. Thompson, J. H., Angulo, M. **Chronic Effects of Nicotine on Gastric Secretion in Vagotomized Rats.** *Experientia* 27(4):404-405, April 15, 1971.

Vagotomized and sham-operated male Sprague-Dawley rats received daily subcutaneous injections of nicotine (2000 micrograms base/2.0 ml/kg) or nicotine control saline (2.0 ml 0.85 g/100 ml w/v NaCl/kg). After 14 days of injections the rats were isolated from food for 40 hours and basal unstimulated gastric secretion collected following pylorus ligation. In sham-operated rats, nicotine significantly increased basal gastric juice volume, acid output and pepsin output. Following vagotomy, however, there were no differences between chronic nicotine- or chronic nicotine control-injected rats. Thus, abdominal vagotomy prevents nicotine-induced gastric secretory stimulation.

71-0512. Thompson, J. H., George, R., Angulo, M. **Some Effects of Nicotine on Gastric Secretion in Rats.** *Proceedings of the Western Pharmacology Society* 14:173-177, 1971.

Vagotomized and sham-operated male Sprague-Dawley rats (250-300 g) with and without hypothalamic lesions were injected subcutaneously for 14 days with either nicotine (2 mg/kg) or NaCl. In sham-operated rats, nicotine significantly increased basal gastric juice volume acid output and pepsin output. Following vagotomy, there was no difference for any parameter between chronic nicotine-, or chronic nicotine control-injected rats. Nicotine still stimulated gastric juice and acid and pepsin outputs after caudal hypothalamic lesions, but these responses were blocked by vagotomy. Anterior hypothalamic lesions blocked the nicotine-induced gastric secretory stimulation. There were no differences between these lesioned rats with or without vagotomy. These results suggest that chronic nicotine-induced gastric secretory stimulation is mediated via anterior hypothalamic activation and intact vagus nerves.

71-0513. Vos-Brat, L. C., Rumke, P. **Immunoglobulin Concentration, PHA Reactions of Lymphocytes *In Vitro*, and Certain Antibody Titers of Healthy Smokers.** Complete English translation of *Jaarboek Kankeronderzoek en Kankerbestrijding* 19:49-53, 1969.

See Abstract 71-0316.

71-0514. Yamagiwa, H. **Studies on the Chronic Gastritis. II. Relationships of Gastric Diseases to Smoking, Drinking and Blood Type.** *Mie Medical Journal* 20(1):89-91, May 1970.

Histological findings of 222 cases of chronic gastritis, 158 cases of duodenal ulcer and 54 cases of gastric carcinoma were observed in relation to smoking, drinking and blood type in the clinical history of the patients. No significant difference was found in the frequency of gastric diseases between non-drinking and drinking patients. Gastric ulcers, duodenal ulcers and gastric carcinoma occurred more frequently in smokers as compared to nonsmokers. Blood type showed no relationship to gastric disease. Neither drinking nor smoking showed any correlation with intestinal metaplasia.

See also, **71-0353, 71-0357, 71-0358, 71-0367, 71-0369, 71-0378, 71-0381, 71-0391, 71-0395, 71-0400, 71-0404, 71-0405, 71-0406, 71-0410, 71-0453, 71-0526**

BEHAVIORAL AND EDUCATIONAL RESEARCH

71-0515. Bjartveit, K. **Restrictive Actions. The Influencing of Smoking Habits by Restrictive Measures.** Complete English translation of "Restriktionsatgarder. Pavirkning av Roykevaner ved Restriktive Tilltak", *Social-Medicinsk Tidskrift* 2(Special No.):123-127, February 1971.

Some of the proposed and practiced methods of restricting tobacco are reviewed, including: reduction or prohibition of tobacco advertising; warnings on cigarette packages or in tobacco advertising; information on tar/nicotine content; limitations of tobacco sales and selling hours; age limitations; upper limits for total content of tobacco per cigarette or of tar/nicotine content per cigarette; increases in tobacco taxes; and increases in no smoking areas and periods. The attitude of the press towards tobacco restrictions, the application of public health methods of disease control to combat tobacco hazards, the possibility of a "backlash" reaction to restrictions, and the importance of evaluating the effects of restrictions after they have been initiated are discussed. In applying restrictions to combat the harmful effects of tobacco, a strategy must be devised that is based on a coordinated effort involving all three types of influencing agents: information, treatment and restrictions.

71-0516. Horn, D. **Epidemiology and Psychology of Cigarette Smoking.** *Chest* 59(5, Supplement):22S-24S, May 1971.

Per capita consumption of cigarettes from 1947 to 1969 is discussed along with possible reasons for the periodic increases and decreases. The 1953-54 reduction in cigarette smoking reflects the effects of the first widespread press accounts of studies linking smoking to lung cancer and to heart and respiratory diseases. The 1964 Surgeon General's Report on Smoking and Health was responsible for another large drop in cigarette consumption. Following a leveling-off period in which increased ex-smokers were balanced by increased women smokers, consumption began to drop around the second half of 1967 and has continued at an accelerating rate for about 2 1/2 years. Reasons for this drop include a change in smokers' attitudes, extensive press reporting of scientific studies on smoking hazards and on various political and control activities in relation to it, antismoking ads on television, and public awareness and acceptance of the evidence against smoking. The roles of the National Clearinghouse for Smoking and Health, and the National Interagency Council on Smoking and Health are briefly described.

71-0517. Kari-Koskinen, O., Hirvonen, L. **Smoking Among the Female Workers of a Cotton Mill.** *Acta Socio-Medica Scandinavica* 2(1):23-27, 1970.

An inquiry into the smoking habits of the female workers of a Finnish cotton mill was carried out by means of questionnaires in the spring of 1969. Of 1029 workers, 16.5 percent smoked. All the 170 women smoked cigarettes, each of them only a single brand, with the exception of five women. Smoking was most frequent among young unmarried women. In the higher social classes it was more common than in the lower. The average number of cigarettes was about ten per day. For 70 percent this was the maxium, and the highest number of cigarettes reported was 20 per day. A total of 87.5 percent of the smokers reported that they inhaled the smoke. Eighty-two percent were of the opinion that smoking did not affect their health while 15 percent reported adverse effects. The results suggest that smoking is on the increase among women. (Auth. Abs. Mod.)

71-0518. Lebovits, B., Ostfeld, A. **Smoking and Personality: A Methodological Analysis.** *Journal of Chronic Diseases* 23(10/11):813-821, March 1971.

A review of studies on smoking and personality shows that little attention is paid to the fact that important differences exist in smoking behavior as a function of age, socio-economic status, family smoking habits, occupation, and religion. When classified according to smoking behavior, various studies not only use different criteria but also make use of what appears to be illogical criteria. Scores on personality tests are frequently used as the independent variable. However, little or no attention is paid to such things as defensiveness; the unavailability of norms that are adequate for the various age, sex and socio-economic groups; the effects of different administrations and settings on the tests; and the validity and reliability of the tests that are used. Statistical analyses have not taken into consideration the fact that a number of the independent variables are significantly intercorrelated and that each may actually represent a somewhat different way of measuring the very same variable. Also, large numbers of tests of significance may be made with no mention of this fact and often only significant findings are included. Hypotheses are not derived from theoretical formulations and little attention is paid to data available in areas such as child and adolescent development, sociology and group dynamics. A few studies have attempted to utilize psychoanalytic constructs and to explain smoking behavior as a function of them. Here, though, the meaningfulness of an independent variable that is studied in retrospect is doubtful.

71-0519. Lichtenstein, E. **Modification of Smoking Behavior: Good Designs–Ineffective Treatments.** *Journal of Consulting and Clinical Psychology* 36(2):163-166, April 1971.

Cigarette smoking provides opportunities to investigate behavior change processes in a meaningful, naturalistic context that still permits adequate measurement and controls. Although several recent behavior modification studies, exemplified by the Marston and McFall paper, are well designed, the treatments employed remain ineffective. It is suggested that treatment ineffectiveness may be due to insufficient pilot (clinical) work and premature freezing of techniques into group programs. It is also argued that process studies of smoking modification must await demonstration of an outcome effect or, at the least, process variables must be shown to effect outcome. The problems involved in verifying smoking rates and whether *Ss* are performing the "homework" assignments frequently given by behaviorists are also discussed. (Auth. Abs.)

71-0520. Markiewicz, K. **Tyton w Wierzeniach i Ceremoniach Religijnych, Magii i Pierwotnym Lecznictwie. [Tobacco in Religious Creeds and Ceremonies, in Magic and in Primitive Medicine.]** *Polski Tygodnik Lekarski* 26(5):191-193, February 1, 1971, Polish.

The ritualistic aspects of tobacco smoking are briefly reviewed. Smoking was a habit of the American Indians, but it was not merely an act undertaken for pleasure. Rather it was a custom based on their primitive culture. The habit was observed in Indians who inhabited what is now called Virginia, Florida, and Peru, who might or might not have had contact with each other, and also in the Yibaros who presumably were not culturally influenced by other Indians. The act of smoking formed part of the religion, and was also a part of mystic invocations. Europeans who adopted the habit later soon ascribed their own interpretations to tobacco use. For example, during the Sixteenth Century the Huguenots thoroughly detested tobacco, believing it to lead to sodomy and hermaphroditism. A study throughout many countries, such as Dahomey in Africa, Brazil, and Mexico, showed that once the habit of tobacco smoking was accepted, it not only led to physical manifestations of diseases which could be diagnosed, but also to psychic changes which may be interpreted as degenerations.

71-0521. Marston, A. R., McFall, R. M. **Comparison of Behavior Modification Approaches to Smoking Reduction.** *Journal of Consulting and Clinical Psychology* 36(2):153-162, April 1971.

Two experimental treatments for the modification of cigarette smoking were compared with two control conditions, using a refined methodology for collecting daily smoking records and providing for an examination of therapist effects. One experimental treatment employed a stimulus satiation technique in which *Ss* were instructed to smoke three cigarettes on each smoking occasion. The second, a hierarchy approach, involved gradual reduction beginning with the period of the day judged easiest for relinquishing cigarettes. In one control treatment, *Ss* used a pill designed to coat the mouth to make cigarettes aversive; the other control groups were instructed to quit, cold turkey. Each of the four conditions showed its own characteristic reduction curve and all reduced to a mean level below 25 percent of base. There was a significant effect of therapist during treatment, but none at six-month follow-up by which time all groups had shown a considerable relapse. (Auth. Abs.)

71-0522. Mausner, B. **Some Comments on the Failure of Behavior Therapy as a Technique for Modifying Cigarette Smoking.** *Journal of Consulting and Clinical Psychology* 36(2):167-170, April 1971.

The failure of behavior therapy for smokers is attributed to two factors: first, the inadequacy of external contingencies, and second, the lack of effect of aversive control. Smokers find it easy to return to smoking once they are outside the therapeutic situation. Data from a role-playing experiment are interpreted to signify that positive reinforcements for refraining from smoking might be more successful than aversive controls in changing smoking behavior. Neither of Marston and McFall's experimental groups showed greater reduction in smoking than their control groups. This was attributed to the weakness of aversive control for the "stimulus satiation" group which was instructed to smoke three cigarettes in rapid succession each time a cigarette was desired. For a "hierarchical reduction" condition in which cigarettes desired least were eliminated, it was proposed that cutting down by eliminating undesired cigarettes might strengthen rather than weaken smoking, since its rewards are, if anything, increased. (Auth. Abs.)

71-0523. Midwives Chronicle. **Action on Smoking and Health.** *Midwives Chronicle* 84(998):94, March 1971.

The goals of the Action on Smoking and Health, an independent organization sponsored by the Royal College of Physicians, are briefly outlined.

71-0524. Newman, A. N. **How Teachers See Themselves in the Exemplar Role in Smoking Education as Evidenced by Their Attitudes and Practices.** *Journal of School Health* 41(5):275-279, May 1971.

This study attempted to determine how elementary and secondary teachers view their own behavior, their awareness of the smoking problem, and whether they would make changes if they believed it would favorably influence their students. Results showed that teachers were mindful of their responsibilities and were willing to restrict smoking as an example to students; were more likely to report a smoking student if they were smokers themselves; and believed by a ratio of 5:1 that teachers should not smoke where smoking is prohibited to students. It was concluded that teachers display a readiness to assume the exemplar role in smoking education.

71-0525. Russell, M.A.H. **Cigarette Dependence: I-- Nature and Classification.** *British Medical Journal* 2(5757):330-331, May 8, 1971.

Smoking is a dependence disorder since most smokers smoke not because they wish to, but because they cannot easily stop. Most people smoke to obtain nicotine and are unsatisfied by nicotine-free cigarettes. Nicotine acts as either a stimulant or a sedative and often shares with other dependence-producing drugs the quality of acting as a primary reinforcer of behavior. Depression, tension, and irritability are some of the psychological withdrawal symptoms, while sleep disturbance, sweating, gastrointestinal changes and a drop in pulse rate are prominent physical withdrawal effects. Some of the past methods of classifying smokers are briefly reviewed and a new scheme based on five types of smoking derived from the various reinforcers of smoking behavior (psychosocial, indulgent, tranquilization, stimulation and addictive) is described.

71-0526. Steinfeld, J. L. **Cigarette Smoking Is on the Increase Among Women--and They Also Find It Harder to Quit.** *Bulletin National Tuberculosis and Respiratory Disease Association* 57(5):2-5, May 1971.

The health hazards associated with smoking by women and especially pregnant women are discussed. Since 1955, the percentage of women smokers has increased in practically every age group, while only 15 percent of the women smokers were able to give up the habit. This argument was primarily attributed to: girls starting to smoke at earlier ages; advertising, particularly by home-making magazines; the fear of weight gain from cessation; desire to break away from old social restrictions; and women being less affected and, therefore, less conscious of the deaths and diseases caused by smoking. Women smokers were found to have 20 percent more unsuccessful pregnancies due to spontaneous abortion, stillbirth, and death of the infant in the first month of life than non smokers.

See also, **71-0379, 71-0398, 71-0403, 71-0466, 71-0534**

TOBACCO ECONOMICS

71-0527. Medical Officer. **Smoke Reduction on Two Fronts.** *Medical Officer* 125(7):84, February 12, 1971.

In 1971 the content of sulfur dioxide and smoke in the British air dropped 6 and 13 percent, respectively, over the previous year. In the three-week period following the publication of the Royal College of Physicians' 1971 report, cigarette sales dropped 10 percent and pipe tobacco sales increased 20 percent.

See also, **71-0530**

BILLS AND LEGISLATION

71-0528. British Medical Journal. **Cowardice About Smoking. (Editorial)** *British Medical Journal* 1(5751):683, March 27, 1971.

The British government is criticized for its lack of effective action on smoking, particularly for not proposing legislation to ban cigarette vending machines, to further restrict cigarette advertising, and to prohibit smoking in public places.

71-0529. Federal Trade Commission. **Report to Congress. Pursuant to the Public Health Cigarette Smoking Act.** Federal Trade Commission, Washington, D.C., December 31, 1970, 24 pp.

The FTC report to Congress on cigarette advertising concerns itself primarily with the effectiveness of cigarette labeling and with the current practices and methods of cigarette advertising and promotion. In the latter, three basic themes are noted to prevail in most advertising: 1) appeals to satisfying taste; 2) association of smoking the advertised brand with desirable personality characteristics; and 3) relieving anxieties about the health dangers of cigarette smoking by the use of humor, the association of cigarettes with undisturbed nature, and claims concerning the effectiveness of a filter. Miscellaneous promotional techniques also used include offers of coupons, trading stamps, or money, a variety of merchandise at special prices, and the mailing of free sample packages. The regulatory activity of the Commission during 1969-1970 is discussed as well as the voluntary regulation of cigarette advertising by the cigarette and broadcasting industries. The commission recommends legislation requiring that the warning on all cigarette packages and advertising be required to read as follows: "Warning: Cigarette smoking is dangerous to health and may cause death from cancer, coronary disease, chronic bronchitis, pulmonary emphysema, and other diseases." Furthermore, a statement setting forth the tar and nicotine content of each cigarette on the package and in all advertising, should be required. Appropriations for massive public education and for research to seek the development of a cigarette not hazardous to health are also recommended. The report is appended by seven documents including a report of tar and nicotine content of the smoke of 120 varieties of cigarettes, dated October 21, 1970.

71-0530. Federal Trade Commission. **Statistical Supplement to Federal Trade Commission Report to Congress. Pursuant to the Public Health Cigarette Smoking Act.** Federal Trade Commission, Washington, D.C., December 31, 1970, 14 pp.

The purpose of this statistical supplement is to update charts previously published by the Commission concerning sales of cigarettes and other products by cigarette manufacturers, expenditures for cigarette advertising in various media, and exposures to cigarette advertising by various age groups to include data for the years 1969 and 1970. As in previous years, these data were obtained by the Commission staff from domestic cigarette manufacturers. Additionally, one portion of this supplement discusses distribution of sample cigarettes during 1969 and 1970 and recommends legislation to prohibit distribution of sample cigarettes through the mail. The data are tabulated to include: total cigarettes sold; per capita consumption; filter and non-filter sales; menthol and non-menthol sales; cigarette sales by size; total sales of cigarette manufacturers (including non-cigarette products); total cigarette advertising expenditures; market share and advertising expenditures of filter cigarette varieties, 100-millimeter length cigarette varieties, and of cigarettes yielding 15 milligrams of tar or less; television advertising of cigarettes (all U.S. inhabitants); and network program advertising (exposures among children and teenagers, ages 2-17).

SMOKING CESSATION METHODS

71-0531. Arvidsson, T. **Views on Smoking Withdrawal. Experiences With Smoking Withdrawal in Stockholm.** Complete English translation of "Synpunkter pa Rokavvanjning. Erfarenheter av Rokavvanjning i Stockholm", *Social-Medicinsk Tidskrift* 2(Special No.):113-116, February 1971.

Since 1956, the Stockholm Smoking Withdrawal Polyclinic has treated approximately 4000 smokers. Methods include: 1) individual treatment where, in addition to general supporting and motivation reinforcing therapy, patients receive daily doses of Skopyl and Egazil to promote mouth dryness which spoils the taste of smoking; 2) group therapy with hyponosis; 3) individual hypnosis; and 4) aversion therapy using electric shock. In a sample study of 100 smokers who attended the clinic, 95 percent were cigarette smokers and 94 percent were in the 20-50 age groups, with an even distribution of men and women. Respiratory troubles and poor health were the prime motives for giving up smoking in 57 percent of the patients; fear of lung cancer was the motive in only 10 percent. Despite the fact that 88 percent of the women and 70 percent of the men claimed nervous difficulties, 85 percent of both sexes were able to stop smoking at the end of the one-month-treatment period. After one year, 35 percent were still nonsmokers, of which 69 percent were men and 30 percent were women. Personal crises, nervous difficulties and a strong desire to smoke were the main reasons for relapse.

71-0532. Johnston, E., Donoghue, J. R. **Hypnosis and Smoking: A Review of the Literature.** *American Journal of Clinical Hypnosis* 13(4):265-272, April 1971.

In this review of the use of hypnosis in the treatment of smoking, most authors claim success but their procedures cannot be reproduced. No systematic approach is evident with the possible exceptions of those based in learning theory concepts. The idea of an underlying tension or neurosis as being causal in smoking behavior is nearly as frequently mentioned as it is omitted. However, only a few of the several who subscribe to the neurosis idea actually use psychoanalytic therapy either exclusively or in part. The most frequently used approach involves the establishment of an aversive state in association with the smell and/or taste of cigarette smoke. One author submits that the procedure of making cigarettes taste bad is inadequate because post-hypnotic effects are temporary, and the subject quickly learns when the bad taste will wear off. Another points out that the experience of a cigarette tasting bad is simply contrary to the smoker's experience. Several authors stress client responsibility but very little is offered as regards methods of motivating the subject. A few authors insist that a light trance is sufficient whereas others propose different treatments depending on the depth of trance obtainable. Many authors use combinations of techniques from among substitute behaviors, planned cut-downs, health pleas, smoking bans during certain periods, auto-suggestion, regression, inconvenience ploys and drugs. None of these combinations appears the same way in any two studies and support for any given combination is weak at best. Also reviewed are the problems of substitute behavior replacing the old smoking behavior, weight gains, and mental conflicts. None of the available studies offer good research evidence attesting to the effectiveness of hypnosis in eliminating smoking behavior.

71-0533. Markiewicz, K. **Niektore Problemy Psychoterapii Nikotynizmu Przewleklego. [Some Problems in the Psychotherapy of Chronic Nicotinism.]** *Wiadomosci Lekarskie* 24(5):491-495, March 1, 1971, Polish.

Psychotherapeutic interest is directed toward the habitual use of tobacco and its products. The habitual smoker is not only prone to develop diseases which are easily diagnosed by the general practitioner, but nicotine, being an alkaloid, upon prolonged intake will also induce a variety of mental disturbances. A number of motives, only one or several of which will be predominant, influences these disturbances of the mind. There are the motives which are biological in nature, such as the way the individual reacts to nicotine. Other motives are sensoric in nature, dealing with the complex of pleasures the individual derives from smoking. Certain motives are pharmacological in nature; these are the oldest ones known and studied more extensively. Still other motives are somatic in nature, like the vegetative effects of nicotine. Psychological motives for the habit produce pleasure for the smoker. Sociological motives are felt to be influenced by customs and propaganda for tobacco use.

71-0534. Russell, M.A.H. **Cigarette Dependence: II–Doctor's Role in Management.** *British Medical Journal* 2(5758):393-395, May 15, 1971.

The predominance of health as a motive for stopping smoking places the physician in a favorable position to advise and influence smokers when they are most susceptible. Evidence has shown that simple, firm, unequivocal advice to stop smoking by a physician to his patient on a single occasion has as good a chance of being effective as any other currently available antismoking measure. The physician must first determine the patient's degree of dependence and his motivation to stop, using persuasion where motivation is lacking. The physician's next step is to guide and support the patient through the withdrawal process, which is basically an exercise in relearning to function efficiently and contentedly without smoking. In the withdrawal process the patient should stop smoking completely as soon as possible so that reinforcement of the old behavior is removed to allow learning of the new behavior to proceed, and to quit long enough for the necessary relearning to be achieved. Placebos, such as lobeline and ascorbic acid, stimulus satiation and the elimination of situational reinforcers of smoking are ancillary measures which a doctor may wish to use.

71-0535. Scharfenberg, G., Benndorf, S., Kempe, G. **Cytisin (Tabex) als medikamentose Raucherentwohnungshilfe. [Cytisine (Tabex) as a Drug Aid in Breaking the Smoking Habit.]** *Deutsche Gesundheitswesen* 26(10):463-465, March 4, 1971, German.

The dehabituation effects of the Bulgarian preparation of Tabex containing cytisine in a double blind test were investigated. Two years following administration, all participants were surveyed about the state of their abstinence. Results showed that of the 66 percent who could be evaluated, 32.2 percent of these patients treated with Tabex were still nonsmokers. As compared to the results achieved by means of only one placebo, the difference was statistically significant. Tabex is recommended as a medical aid for the cessation of smoking.

71-0536. Wetterqvist, H. **Points in the Matter of Giving Up Smoking. Smoking Withdrawal in Lund.** Complete English translation of *Social-Medicinsk Tidskrift* 2(Special No.):111-112, February 1971.

At a smoking withdrawal clinic at Lund Hospital, Lund, Sweden, 191 men and 99 women were treated in the course of one year. Treatment consisted of subcutaneous injects of 0.125 mg methyl scopolamine once a day for at least two weeks and additional injections every other day or every third day for the following two weeks. Scopolamine was also administered orally, two tablets two or three times daily, but without effect. In all, 36 (19 percent) men and 12 (12 percent) women were free of smoking one year after having completed the cure. The results, although disappointing, correspond well with other smoking withdrawal experiences in Sweden and abroad.

See also, **71-0519, 71-0521, 71-0522, 71-0539**

GENERAL

71-0537. Egsmose, T. **Socioeconomic Consequences of Smoking. An Attempt at Systems Analysis of the Socioeconomic Consequences of Smoking.** Complete English translation of "Samhallsekonomiska Konsekvenser av Rokning. Ett Forsok Till Systemanalys av Rokningens Samhallsekonomiska Konsekvenser", *Social-Medicinsk Tidskrift* 2(Special No.):95-96, February 1971.

A systems analysis approach to combating the health problem of tobacco smoking is briefly outlined in terms of the socioeconomic consequences caused by smoking.

71-0538. Lewine, H. **Goody-bye to All That.** New York, McGraw-Hill, 1970, 128 pp.

A historical review of the international trends in cigarette utilization and the growth of the cigarette industry is presented. The development and operation of the individual tobacco companies, including their leaders, slogans, advertising campaigns, etc., are discussed along with the political, social, and economic forces that have influenced cigarette consumption. Also included are many illustrations of cigarette advertisements, packages, trade cards, and photographs of celebrities smoking cigarettes.

71-0539. Pullman, J. S. **Connecticut Anti-Smoking Action in the 1960s.** *Connecticut Health Bulletin* 85(1):30-39, January 1971.

A review of the movement to combat smoking sponsored by the Task Force on Smoking of the Connecticut Health League is presented. Highlighted in this synopsis are the 1965 Stop Smoking Symposium, the Conference on Helping Youth With Problems on Smoking, and the establishment of group stop-smoking clinics.

71-0540. Terry, L. L. (Chairman) **National Conference on Smoking and Health. A Summary of Proceedings. San Diego, September 9-11, 1970.** New York, National Interagency Council on Smoking and Health 1970(?), 225 pp.

These conference proceedings review the present status of cigarette smoking control and public education activities, and the latest scientific research regarding the health consequences of cigarette smoking. The addresses and workshops discussed recent changes in smoking and health, the rights of nonsmokers, the organization of health agencies involved with the smoking problem, adult decision making, the female smoker, smoking and health programs in occupational settings and with clubs and organizations, smoking cessation clinics, recent developments in smoking cessation methods, the role of health professionals and mass communication in smoking education, smoking education programs influencing youth, and the San Diego community laboratory project to modify smoking behavior over a 5-year period.

71-0541. Von Holst, H. E. **Smoking and Our Health--Introduction.** Complete English translation of "Rokning och Var Halsa--Introduktion", *Social-Medicinsk Tidskrift* 2(Special No.):62-64, February 1971.

Clinical and epidemiological investigations of the past decade clearly show that cigarette smoking in man plays a significant role in the development of cardiovascular disease, respiratory tract diseases and other diseases such as gastric and duodenal ulcers and cancer of the bladder; and that smoking contributes to increased infirmity, employment disability and mortality. Mortality is 30 to 80 percent higher in smokers than in nonsmokers. Cigarette smokers work an average of 20 percent fewer days than nonsmokers where either sickness or accident are concerned. Regulations limiting tobacco advertising have been introduced in Italy, Norway and the U.S., and are under discussion in other countries.

See also, **71-0523**

CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-0542. Alfsen, A., Chiancone, E., Antonini, E., Waks, M., Wyman, J. **Studies of the Reaction of Haptoglobin with Hemoglobin and Hemoglobin Chains. III. Observations on the Kinetics of the Reaction of the Haptoglobin–Hemoglobin Complexes with Carbon Monoxide.** *Biochimica et Biophysica Acta* 207(3):395-403, 1970.

Hemoglobin bound to haptoglobin reacts with CO at a faster rate than free hemoglobin, both in flow and flash experiments. The change in the kinetics of recombination with CO measured in flash photolysis experiments after mixing hemoglobin with haptoglobin has the same time-course as the binding observed in fluorescence-quenching experiments. When deoxyhemoglobin is exposed to haptoglobin even for a long time, a small but finite fraction of hemoglobin is bound, as revealed by the presence of fast-reacting material. In hemoglobin–haptoglobin mixtures, the appearance of fast-reacting material is enhanced. Mixtures of hemoglobin and haptoglobin in a 1:1 molar ratio, which show no free hemoglobin in electrophoresis, are heterogeneous in the reaction with CO due to the presence of fast- and slow-reacting material. The functional heterogeneity of bound hemoglobin disappears when haptoglobin is in excess. These effects reflect the presence of different types of Hb-Hp complexes. (Auth. Abs.)

71-0543. Becker, R. F., Martin, J. C. **Vital Effects of Chronic Nicotine Absorption and Chronic Hypoxic Stress During Pregnancy and the Nursing Period.** *American Journal of Obstetrics and Gynecology* 110(4):522-533, June 15, 1971.

Four experiments were performed in which 3.0 mg of nicotine/kg of body weight twice daily was administered to the gravid rat during the entire gestational period. Other pregnant rats were subjected to hypoxic stress once daily during gestation. Increasing the amount of nicotine administered as weight increased over the gestational period had no greater effect than continuing the dose begun on Day 0. Continuing injections until Day 21 resulted in no additional effects over injecting through Day 20. The offspring of rats given nicotine were significantly more underweight at birth than saline-injected controls; fewer live young were born; and mothers were delivered of their infants later and gained less weight during gestation. Offspring whose mothers received nicotine throughout the nursing period in addition to the above had a poorer survival chance after birth. Hypoxic young tended to be lighter in weight at birth. The sex ratio was shifted to some extent for both nicotine-injected and hypoxic groups in favor of males. (Auth. Abs.)

71-0544. Booth, J., Boyland, E. **Enzymic Oxidation of (−−)-Nicotine by Guinea-Pig Tissues** *In Vitro*. *Biochemical Pharmacology* 20(2):407-415, February 1971.

In this *in vitro* experiment, (−−)-nicotine is oxidized by NADPH and oxygen dependent mixed function oxidases of guinea-pig tissues to two optically-active stereoisomers of nicotine-1′-oxide and to cotinine when the soluble fraction is also present. Of the tissues examined liver is the most active in synthesizing these three metabolites although there is some activity in lung and kidney but little or none in brain, heart, spleen or blood. The ratios of the amounts of the three metabolites vary with different tissues. The substrate concentration affects the rate of formation of these oxidation products differently, relatively large amounts of *laevo*-nicotine-1′-oxide being synthesized at the lower (−−)-nicotine concentrations. None of the three metabolites is metabolized further when incubations are in air, but under anaerobic conditions nicotine-1′-oxides are enzymically reduced to nicotine at different rates. With initial substrate concentration of 0.4 mM, *laevo*-nicotine-1′-oxide is reduced six times as rapidly as the dextrorotatory isomer. (Auth. Abs. Mod.)

71-0545. Bracco, M., Curti, P. C. **La Sostanza Tensio-Attiva Dell'Induito Alveolare: Costituzione Chimica, Origine e Funzione Nella Fisiologia Polmonare. Nuove Acquisizioni Chimiche e Istochimiche. [The Tensio-Active Substances of the Alveolar Lining: Chemical Structure, Origin, and its Function in Pulmonary Physiology. New Chemical and Histochemical Findings.]** *Annali Medici di Sondalo* 18(1):5-58, January-March 1970, Italian.

The results of research on the chemical structure of the tensio-active substance of the alveolar lining and on its histochemical demonstration are presented. The surface-activity of lung washing with saline is related to lipid spherules or liposomes. By centrifugation it is possible to isolate a fraction of pure liposomes; this fraction is the only one provided on the typical surface-area characteristics. If contamination with blood and tissue is carefully avoided, the liposomic fraction of the lung washings is composed purely of phospholipids with only traces of protein. The behavior of the alveolar granules is identical to that of the tensio-active liposomes fractionated from the pulmonary lavage with saline. Pretreatment of lung sections with anhydrous cold acetone does not alter the histochemical reaction which however disappears following lavage of the sections with acetone (75 percent) in water, chloroform, or ethanol. This histochemical method has been applied to the study of experimental pathology in white mice in comparison with volume-pressure diagrams of the excised lungs. Prolonged inhalation of cigarette smoke provoked in mice a marked modification of the static volume-pressure diagram of the excised lungs, indicative of an increased retractive pressure. The mechanical alterations are related to profound derangement of the alveolar surfactant.

71-0546. Brody, J. S., Coburn, R. F. **Effects of Elevated Carboxyhemoglobin on Gas Exchange in the Lung.**

Annals of the New York Academy of Sciences 174(Art. 1):255-260, October 5, 1970.

Measurements in patients corroborate theoretical calculations and make it unnecessary to postulate that small amounts of CO directly interfere with alveolar gas exchange. These studies have shown that the tissue hypoxia produced by CO inhalation may be accentuated by rather marked degrees of arterial hypoxemia in patients with heart or lung disease or in normal subjects when ventilation-perfusion (V/Q) ratios become abnormal, and that the arterial hypoxemia in these instances results from the CO-induced changes in the shape of the oxyhemoglobin dissociation curve.

71-0547. Chakraborty, B. B., Kilburn, K. D., Thornton, R. E. **Reduction in the Concentration of Aromatic Polycyclic Hydrocarbons in Cigarette Smoke.** *Chemistry and Industry* 24:672, June 12, 1971.

Smoke condensate collected from cigarettes made from flue-cured cut tobacco treated with bismuth oxide and calcium oxalate was analyzed for aromatic polycyclic hydrocarbons by gas chromatography. Results showed that both additives caused reduction of up to 50 percent in the delivery of aromatic polycyclic hydrocarbons. In terms of the total concentration of the measured aromatic polycyclic hydrocarbons in cigarette smoke (as defined by total particulate matter measurements), the reduction was 45 percent for bismuth oxide and 30 percent for calcium oxalate.

71-0548. Chance, B., Erecinska, M., Wagner, M. **Mitochondrial Responses to Carbon Monoxide Toxicity.** *Annals of the New York Academy of Sciences* 174(Art. 1):193-204, October 5, 1970.

A study of the dynamic response of the CO-inhibited respiratory component of isolated mitochondria gives several important hints for those who are interested in the total picture of carbon monoxide toxicity. First, compensatory mechanisms whereby the respiratory chain is able to diminish its inherently high vulnerability to carbon monoxide are identified as branching and cushioning phenomena. Essentially, they can be defined as an ability of the matrix of enzymes involved in membrane-bound electron flow to be activated effectively to establish redox patterns of optimal effectiveness by remaining uninhibited cytochrome molecules, thus enabling the flow of oxidizing equivalents to spread through the totality of the membrane components. Time factors associated with this response are related not only to the kinetics of the process itself, but also to the function of the large pool of reducing substances in the mitochondrial electron transfer system. The times required for these pools to be activated by CO-inhibited cytochrome depend critically upon the metabolic state which, in turn, controls the reactivity of these pools in electron flow. The extreme sensitivity of mitochondria in the uncoupled or metabolically active state to small concentrations of CO in transient changes from anoxia to normoxia is emphasized and pointed to as a further complexity in considering the totality of tissue CO toxicity. (Auth. Abs.)

71-0549. Decherd, J. F. **The Medical Effects of Marihuana.** *Southwestern Medicine* 51(8):170-172, August 1970.

As far as can be critically ascertained from a review of recent available literature from well-controlled studies, cannabis increases the pulse rate to a mean of 10 beats per minute above resting values at 15 minutes. This effect is dissipated after 90 minutes. There is no change in respiratory rate or in blood sugars. The inhaled smoke is irritating and long, continued exposure to it is suggested to induce chronic respiratory disorders. Interestingly, hyperphagia has been reported by a number of marihuana users. There is no ready explanation for this medically, especially in terms of blood glucose concentrations. Whether there is some increase in the simple desire for food or whether food ingestion becomes more pleasurable has not been elucidated. No physical dependence or tolerance has been demonstrated. Further, it has not been demonstrated that cannabis causes any lasting mental or physical changes. The extent of psychological dependence on marihuana in the United States is not known. It may be reasonably presumed to be less than that of narcotic drugs. Cannabis does seem to uniformly cause conjunctival injection and as a corollary does not cause pupillary dilatation. The suggested teratogenic effects of marihuana and the effects on the liver cells are fragmentary and await further confirmation after better and more controlled studies have been done. Further, the long-term effects of marihuana upon man are forthcoming and cannot be reasonably predicted at this time, just as the long-term effects of tobacco were not realized until 10 or 15 years ago. (Auth. Abs. Mod.)

71-0550. Dragiyev, M., Ivanchev, V. **Izmeneniya Aktivnosti Adenozintrifosfatazy, Suktsindegidrogenazy Pecheni, Pochek, Serdtsa i Mozga Krolikov pod Vliyaniyem Toksicheskikh Veshchestv, Obrazuyushchikhsya pri Fermentatsii Tabaka. [Changes in the Activity of Adenosine Triphosphatase and Succinic Dehydrogenase of the Liver, Kidneys, Heart and Brain of Rabbits Under the Influence of Toxic Substances Formed in the Fermentation of Tobacco.]** *Gigiena Truda i Professional'nye Zabolevaniia* 15(2):32-35, 1971, Russian.

Changes occurring in the activity of adenosine triphosphatase and succinic dehydrogenase of the liver, kidneys, heart and brain of rabbits following an acute and subacute complex action of toxic substances formed during factory fermentation of tobacco were studied. The adenosine triphosphatase activity increased after the 5th day. Starting from the 10th day, it quickly decreased, dropping after the 15th day below that observed in control animals and remaining at this level until the 35th day (the end of the experiment). The adenosine triphophatase activity also declined in an acute experiment. The succinic dehydrogenase activity increased progressively up to the 10th day and remained at this level until the end of the experiment. It also increased in animals undergoing an acute test. It was concluded that a complex action of substances formed during factory fermentation of tobacco provoked a deranged dephosphorylation of the adenosine triphosphate and of one of the Krebs cycle substrates in the test animals. (Auth. Abs. Mod.)

71-0551. Environmental Protection Agency. Air Pollution Control Office. **Air Quality Criteria for Nitrogen Oxides.**

Environmental Protection Agency, Air Pollution Control Office, Washington, D.C., Air Pollution Control Office Publication No. AP-84, January 1971, 94 pp.

This publication reviews the chemical and physical characteristics of the nitrogen oxides and considers the relative merit of various analytical methods for measuring them in the atmosphere. It also discusses their effects on visibility, vegetation and materials; their toxicological effects on animals and humans; and epidemiological studies that assess the general population dose response and the specific response of children to nitrogen oxides. There is no evidence that NO produces significant adverse health effects at the ambient atmospheric concentrations thus far measured. NO_2 exerts its primary toxic effect on the lungs and at concentrations greater than 188 mg/m^3 it is lethal to most animal species. Hamster studies have shown that the combined effects of NO_2 (28.2 mg/m^3) with tobacco smoke for short periods produces irreversible, marked alterations in the surface morphology of lung tissue, an atypical structure of mucus-secreting cells, a marked loss of cilia, and a decreased resistance to bacterial pneumonia. The short-term exposure of humans to NO_2 has produced a transient increase in airway resistance (9.4 mg/m^3 for 10 minutes) and pulmonary edema and reduced vital capacity (162 mg/m^3 for 30 minutes). In long-term exposure studies, an increased incidence of acute respiratory disease was observed in family groups when the mean range of 24-hour NO_2 concentrations, measured over a 6-month period, was between 117 and 205 micrograms/m^3 and the mean suspended nitrate level during the same period was 3.8 micrograms/m^3 or greater. The frequency of acute bronchitis increased among infants and school children when the range of mean 24-hour NO_2 concentrations, measured over a 6-month period, was between 118 and 156 micrograms/m^3 and the mean suspended nitrate level during the same period was 2.6 micrograms/m^3 or greater.

71-0552. Food and Cosmetics Toxicology. **Polybenzoid Hazards.** *Food and Cosmetics Toxicology* 7:169-171, March 1969.

The hazards presented by polycyclic aromatic hydrocarbons (PAH) which include some of the most potent carcinogens known are reviewed. Sources of exposure to PAH include industrial exposure as well as exposure to air of industrial cities, in cigarette smoke, in certain foods, and in water and soil. Education and improvement in personal hygiene could go a long way towards eliminating these hazards, especially in the case of industrial workers and heavy cigarette smokers.

71-0553. Forster, R. E. **Carbon Monoxide and the Partial Pressure of Oxygen in Tissue.** *Annals of the New York Academy of Sciences* 174(Art. 1):233-241, October 5, 1970.

The possible effects of HbCO on tissue Po_2 produced by the shift of the oxyhemoglobin curve to the left are reviewed. Normally man has about 0.5-1 percent HbCO in his blood, of which 0.4 percent represents the effect of endogenously produced CO. This total value can reach 5-10 percent in smokers. At present, the major effect of HbCO in the blood is predicted to be a lowering of tissue venous Po_2 produced by changes in the oxyhemoglobin equilibrium curve, although other sites of action should be investigated. The precise functional effects of the expected decreases in tissue Po_2 are difficult to predict because of lack of knowledge of the tissue itself.

71-0554. Fulginiti, S., Orsingher, O. A. **Effects of Learning, Amphetamine and Nicotine on the Level and Synthesis of Brain Noradrenaline in Rats.** *Archives Internationales de Pharmacodynamie et de Therapie* 190(2):291-298, April 1971.

A conditioning session in a shuttle-box (100 trials 30 sec inter-trial intervals) did not modify the noradrenaline (NA) levels in hypothalamus and hemispheres of rats when compared to controls. Animals presented only with unconditioned stimuli (100 electric shocks at 30 sec interval) showed a significant decrease in the NA levels in both brain structures. Moreover, the conditioning session increased the rate of synthesis of NA in whole brain, as measured by the injection of tyrosine-C^{14}. DL-amphetamine sulphate (2 mg/kg) and nicotine (0.2 mg/kg) did not provoke appreciable modifications in the rate of conversion of tyrosine-C^{14} to brain NA when animals were killed 80 min after treatment; when assayed at 20 min, amphetamine, but not nicotine, evidenced a marked increase in the specific activity of NA. Possible causes for the lack of effect of nicotine are discussed. (Auth. Abs.)

71-0555. Gilgen, A. **Luftverunreinigung und Gesundheit. [Air Pollution and Health.]** *Zeitschrift fur Praventivmedizin* 15(3):217-230, May-June 1970, German.

The effects of air pollution on morbidity and mortality have been presented in this review of the literature. Various well-known smog catastrophies are cited. It is concluded that the smoking habits and the socio-economic conditions must be understood in order to evaluate the importance of air pollution in lung cancer etiology. In addition, it is considered that the role of air pollution itself in the genesis of lung cancers must be viewed more critically. The probability of the promoting effect of air pollution on mortality due to other types of cancers, however, appears to have been demonstrated. The increased incidence of chronic bronchitis due to air pollution is established, with the severity of the symptoms influenced by meteorological factors. Clear evidence of the damage to lung function without visible signs of illness is not yet available. Fuller investigations on subjective stress caused by air pollution are lacking.

71-0556. Groenen, P. J., Van Gemert, L. J. **Flame Photometric Detection of Volatile Sulphur Compounds in Smoke From Various Types of Cigarettes.** *Journal of Chromatography* 57(2):239-246, May 6, 1971.

A gas chromatograph with flame photometric detection was used to detect at least thirty-seven sulfur compounds in the vapor phase of cigarette smoke. A suggestion as to their possible identity is given for many of them. According to the literature only thirteen sulfur compounds so far have been found in smoke. In a comparative study on three types of cigarettes, prepared from flue-cured, air-cured and sun-cured tobacco, respectively, a great similarity was observed, but there were also some striking differences between air-cured tobacco on one hand and flue-cured and sun-cured tobacco on the other. It is possible that on this basis a method may be developed for the determination of the amount of air-cured tobacco in an unknown tobacco blend. Nothing is known about the importance of sulfur compounds with respect to the health of the smoker, though one could speculate on a possible protective effect against alkylating smoke constituents. (Auth. Abs.)

71-0557. Haase, E., Muller, W. **Messbare Beeinflussung des EOG durch Zigarettenrauchen? [Measurable Effects on the EOG by Cigarette Smoking?]** *Klinische Monatsblatter fur Augenheilkunde* 158(5):677-681, May 1971, German.

The dark phase of the second EOG in two directly subsequent EOG leads shows a significant lowering of the dark depth. Leads on different days under approximately the same conditions do not show this behavior. The mean value EOG's of the trial groups correspond to one another. It is therefore recommended to record control EOG's, if possible, on another day. These studies indicate no significant changes in the EOG caused by rapid smoking of two filterless cigarettes as compared to control leads on another day under otherwise similar conditions. (Auth. Abs. Mod.)

71-0558. Harke, H.-P., Drews, C. J., Schuller, D. **Uber das Vorkommen von Norbornenderivaten in Tabakrauchkondensaten. [Appearance of Norbornene Derivatives in Tobacco Smoke Condensates.]** *Tetrahedron Letters* (43):3789-3790, 1970, German.

The application of mass spectrometry in conjunction with gas chromatography revealed the presence of several bicyclo compounds, hitherto not known to be present in tobacco smoke condensate. These compounds are derivatives of bicyclo-(2.2.1)-2-heptene, apparently resulting from a Diels-Alder reaction in the smoke condensate. Details of the analysis are included.

71-0559. Kroller, E. **Ergebnisse von Abrauchversuchen mit Filterzigaretten. 2. Mitteilung. [Results of Smoking Tests With Filter Cigarettes. Second Communication.** *Bundesgesundheitsblatt* 12(20):319, 1969, German.

Twenty-five commercial brands of cigarettes were processed in a smoking machine under identical conditions. The cigarettes were first smoked with filters and then smoked after removal of the filters. The effectiveness of the filters for their retention of tars and nicotine could then be determined by the difference in their yields. Five had a filter effectiveness (retention) for nicotine below 30 percent, 14 had a filter effectiveness of 30 to 40 percent, 5 from 40 to 50 percent and 1 above 50 percent effectiveness. The smoke of 6 brands contained up to 1.0 mg nicotine per cigarette; 11 had from 1.0 to 1.3 mg nicotine and 8 had more than 1.3 mg. Only in the smoke of 3 brands was the tar content below 15 mg; 13 contained from 15 to 20 mg tar and 11 above 20 mg. The cigarettes were not identified by name but, in continuation of a previous analysis, were numbered 41 to 65.

71-0560. Kroller, E. **Ergebnisse von Abrauchversuchen mit Filterzigaretten. 3. Mitteilung. [Results of Smoking Tests With Filter Cigarettes. Third Communication.]** *Bundesgesundheitsblatt 13*(7):92-93, March, 1970, German.

Thirty commercial brands of cigarettes were processed in a smoking machine under identical conditions. The cigarettes were first smoked with filters and then smoked after removal of the filters. The effectiveness of the filters for their retention of tars and nicotine could then be determined by the difference in their yields. Five had a filter retention for nicotine below 30 percent, 17 from 30-40 percent, 7 from 40-47 percent, and 1 a retention of 53 percent. The nicotine content of the smoke of 6 brands was below 1.0 mg, of 13 from 1-3 mg and of 11 above 1.3 mg. The tar content of the smoke of 4 brands was below 15 mg; 13 contained from 15-20 mg, and 14 had more than 20 mg tar. The brands were not identified by name but were numbered 66 to 95. A table summarizes the analytical data of 95 analyses (this includes 25 brands tested in 1966 and 30 tested in 1968).

71-0561. Lovkova, M. Ya., Il'in, G. S., Kliment'eva, N. I. **Role of Aspartic Acid in the Biosynthesis of Nicotine and Anabasine.** Complete English translation of *Fiziologiya Rastenii*, 17(2):409-415, March-April 1970.

To study nicotine and anabasine biosynthesis in *N. tabacum L. seedlings* and *N. glauca L.* shoots, U-C^{14}-N^{14}-aspartic acid was introduced as a precursor of the alkaloids. At the end of the experiments preparations of nicotine and anabasine were isolated from the plant material, and their oxidative cleavage to nicotinic acid was performed. It was shown that aspartic acid is a precursor of nicotine and anabasine; however, its role in the biosynthesis of these alkaloids differs. Thus, after incorporation into nicotine, the nitrogen of aspartic acid is utilized primarily for biosynthesis of the pyridine ring, while the carbon atoms participated in the formation both of the pyridine and of the pyrrolidine rings of the alkaloids. In anabasine biosynthesis, on the contrary, aspartic acid participates primarily in the formation of the piperidine ring of the alkaloid, while it is incorporated less actively into the pyridine heterocycle. Possible pathways of the utilization of aspartic acid in nicotine and anabasine biosynthesis are considered. (Auth. Abs.)

71-0562. Markiewicz, K. **Passive Smokers. The Harm From Passively Inhaled Smoke of Cigarettes Smoked by Others.** Complete English translation of "Bierni Palacze. O Szkodliwosci Biernie Wdychanego Dymu z Papierosow Palonych Przez Innych", *Polski Tygodnik Lekarski* 25(52):2041-2042, December 28, 1970.

See Abstract 71-0393.

71-0563. Michael, L. W., Menden, E. E., Petering, H. G. **Copper-Binding Activity of Tobacco Smoke Condensate.** *Environmental Science and Technology* 5(3):249–251, March 1971.

The distribution of copper between a buffered aqueous solution of the metal ion and an organic solution of tobacco smoke condensate (TSC) in 4-methyl-2-pentanone (MIBK) has been studied. The analytical parameters, metal ion and hydrogen ion concentrations were investigated. Metal ion concentrations were determined by atomic absorption spectrophotometry. TSC was collected with use of a Mason Mark III Smoker and acetone traps maintained at 0°C. This material was transferred to MIBK by evaporation at reduced pressure. A 10-ml aliquot of an aqueous solution 0.1M in 2-amino-2-(hydroxymethyl)-1,3-propanediol (TRIS) 0.01M in $CuCl_2$ and pH 5.6 to 6.1 was equilibrated with an equal volume of the MIBK solution of TSC, which contained the equivalent of five cigarettes. Analysis of an aliquot from the organic phase after equilibration of the two phases yielded a maximum value of 300 micrograms of copper per cigarette when fresh, nonfractionated TSC was used. This simple, rapid extraction technique has been used to determine variations in the chemical activity of tobacco smoke condensate. (Auth. Abs.)

71-0564. Montesano, R. **Systemic Carcinogens (N-Nitroso Compounds) and Synergistic or Additive Effects in Respiratory Carcinogenesis.** *Tumori* 56(6):335-344, November-December, 1970.

Systemic carcinogens induce respiratory tract tumors in various animals species. Typical examples of systemic carcinogens are the N-nitroso compounds, which require metabolic conversion to exert their carcinogenic effect. In this review particular emphasis is put on the comparative studies performed in the same species with different nitrosamines, thus providing an experimental model in which it is possible to examine and correlate the biochemical changes preceding the development of detectable tumors and the carcinogenic effect. In addition studies describing synergistic or additive effects in respiratory carcinogenesis are reviewed and discussed. (Auth. Abs.)

71-0565. Nikolova, M. Ye. **Radioaktivnyy Faktor Tabachnogo Dyma. [Radioactive Factors in Tobacco Smoke.]** *Gigiena i Sanitariia* 35(8):89-93, August 1970, Russian.

The possible role of radioactivity in the genesis of lung cancer has occasioned this review of the radioactive elements present in air, soil and tobacco. The maximal and minimal values of Po^{210} in tobacco in the U.S.A., South Africa, Rhodesia, New Zealand and the USSR for select years is presented. Soviet tobacco, according to one source, contains from 600 to 1600 picocuries/kg tobacco leaf. The Po^{210} content in tobacco products is lower because of isotope degradation during the fermentation process and subsequent warehouse storage. One analysis of the Po^{210} content of a smoked cigarette shows 9 percent Po^{210} in the ash, 29 percent in the butt, 8 percent in the filter and 50 percent in the inhaled smoked. Unfiltered cigarettes have a higher Po^{210} content in the smoke but the filter is not considered as having sufficient protective activity. The biological importance of Po^{210} with respect to lung tissue is debated and it is evident that the role of Po^{210} in cigarette smoke requires further clarification.

71-0566. Pangborn, R. M., Sharon, I. M. **Visual Deprivation and Parotid Response to Cigarette Smoking.** *Physiology and Behavior* 6(5):559-561, May 1971.

Cigarette smoking significantly increased parotid salivary secretion in eight smokers and eight nonsmokers. Obstructing vision by wearing opaque goggles consistently reduced the salivary response to smoking in all 16 subjects. Unstimulated resting levels were lower when vision was blocked, suggesting a more general phenomenon than merely removal of the sight of the stimulus-object. Smoking cigarettes through a Cambridge filter assembly, which trapped the particulate matter and rendered the exhaled smoke invisible, had no effect on salivary secretion. This indicates that the salivary stimulation derives from irritating materials in the gas phase of the smoke. (Auth. Abs.)

71-0567. Rees, E. D., Mandelstam, P., Lowry, J. Q., Lipscomb, H. **A Study of the Mechanism of Intestinal Absorption of Benzo(*a*)pyrene.** *Biochimica et Biophysica Acta* 225:96-107, January 5, 1971.

Benzo(*a*)pyrene and other polynuclear aromatic hydrocarbons are readily absorbed from the gut when fed to rats, but little is known about the mechanism of the absorption. To study the mechanism, everted sacs of small intestine were incubated in a medium containing a lipid emulsion of benzo(*a*)pyrene (50–1500 micro M). After incubation, the concentration of benzo(*a*)pyrene in the sac tissue and in the medium inside the sac was determined by spectrofluorimetric analysis of chloroform extracts. The data are in accord with a mechanism of physical adsorption of benzo(*a*)pyrene to the intestinal mucosal surface and then passive diffusion into and through the intestinal wall. Two phases of adsorption are postulated: first, unilayer (Langmuir) adsorption, then multilayer (Polanyi) adsorption which would account for the exponential nature of the accumulation.

71-0568. Rodkey, F. L. **Discussion: Carbon Monoxide Estimation in Gases and Blood by Gas Chromatography.** *Annals of the New York Academy of Sciences* 174(Art. 1):261-267, October 5, 1970.

Carbon monoxide content of blood and respiratory gases may be measured by gas chromatography. The CO present in the gas sample (or liberated from a blood sample) is separated from other gases on a 5A molecular sieve column. The column effluent containing CO is mixed with hydrogen and the CO is catalytically reduced to methane for detection by flame ionization. The extreme sensitivity of this detection system allows accurate blood CO content determination with 0.1 ml of blood. Larger volumes of blood may be used for samples of extremely low (less than 0.05 volumes percent) CO content. Respiratory gas or ambient air is analyzed with samples of approximately 5 ml. The transient effects of oxygen in the sample do not interfere with CO estimation. Carrier gas of low CO and CH_4 contamination should be used when the CO content of the gas sample is below 1 ppm. A coefficient of variance for the analysis of about ± 1 percent was obtained for measurements of CO content of blood and gases. (Auth. Abs.)

71-0569. Rouch, Y., Rioufol, F., Bourbon, P. **Oxycarbonemie Spontanee et Apres Exposition Pendant Quelques Minutes a une Atmosphere a Un Pour Mille d'Oxyde de Carbone Chez 43 Sujets. [Carbon Monoxide Content in Blood: Normal and After a Few Minutes Exposure to an Atmosphere Containing One Part per**

Thousand Carbon Monoxide in 43 Subjects.] *Archives des Maladies Professionnelles, de Medecine du Travail, et de Securite Sociale* 32(3):271-282, March 1971, French.

The permanent presence of CO in blood is now a well established fact. This remanent CO could have two origins: atmospheric pollution and hemoglobin catabolism (breaking of the alpha-methane bridge). The CO level is variable, higher on the average in smokers than in nonsmokers; however, in heavy smokers, the blood content is in one out of two cases as low as in nonsmokers. A short, 4-minute exposure to an atmosphere containing one part per thousand CO in air using the "stable state" method leads to an average rise of 0.45 ml of CO per 100 ml of blood, corresponding to a blocking of 2 parts per 100 of hemoglobin. In smokers, an identical quantity of hemoglobin becomes inadequate to convey oxygen, but the tobacco smoke in itself plays a supplementary toxic role upon the upper respiratory passages. This rise of CO in the blood is on the average identical even though individual differences exist which are not explained either by the initial level, or by the use of tobacco, or by the quality of the pulmonary exchanger. These facts justify a further study. (Auth. Abs. Mod)

71-0570. Roughton, F.J.W. **The Equilibrium of Carbon Monoxide With Human Hemoglobin in Whole Blood.** *Annals of the New York Academy of Sciences* 174(Art. 1):177-188, October 5, 1971.

A review of research on the equilibria of carbon monoxide with hemoglobin in whole human blood is presented. Among the subjects reviewed are: the validity of Haldane's first law; the effects of partial saturation of hemoglobin with one gas upon the equilibrium of the residual hemoglobin with the other gas; the comparison of the COHb dissociation curve (in the absence of oxygen) with the oxyhemoglobin dissociation curve (in the absence of carbon monoxide; and recent results on the COHb and oxyhemoglobin dissociation curves at PCO_2 40 torr, pH 7.4, 37° C.

71-0571. Rowlands, J. R., Gause, E. M. **Reaction of Nitrogen Dioxide With Blood and Lung Components. Electron Spin Resonance Studies.** *Archives of Internal Medicine* 128(1):94-100, July 1971.

Electron spin resonance studies of the effects of nitrogen dioxide and cigarette smoke upon blood and lung tissue components were performed. *In vivo* exposure of small animals to NO_2 and cigarette smoke has been interpreted in terms of pollutant reaction with the heme moiety of hemoglobin. Results imply that the pollutants have migrated through the erythrocyte membrane. So as to understand the effects of these pollutants upon the membranes themselves, various model systems have been studied, particularly the interaction of nitrogen dioxide with unsaturated lipids. Three stable free radicals have been characterized as products of these reactions; and a short-lived initial free radical was observed, the structure of which provides evidence as to the initial reaction site and mechanism. (Auth. Abs.)

71-0572. Rubinstein, E. H., Sonnenschein, R. R. **Modifications of the "Alarm" Pattern by Nicotine.** *Neuropharmacology* 10(3):247-258, May 1971.

The effect of nicotine on the behavioral and autonomic response pattern, "alarm", evoked in awake cats implanted with recording devices by stimulation of stereotaxically oriented hypothalamic electrodes was studied. Before stimulation, the lowest effective intravenous infusion rate of nicotine (10 micrograms/min) induced EEG desynchronization, increased gastrointestinal motility and decreased heart rate. As the infusion rate was raised to 50 micrograms/min, the arterial pressure increased, and moderate iliac and mesenteric vasoconstriction occurred. The effects of nicotine on the response to short hypothalamic stimulation (100-500 msec) were: less tachycardia, a marked post-stimulus enhancement of gastrointestinal motility, a decreased threshold for growling, and an increased number of somatic responses (head turn). The effects of nicotine on the response to long hypothalamic stimulation (1-5 sec) were, in addition, a more marked pressor response and a reduction of the iliac vasodilatation. (Auth. Abs.)

71-0573. Rumen, N. M., Chance, B. **Heme–Heme Interaction of Crystalline Lamprey Hemoglobin. Kinetics and Equilibrium of the Reaction of Carbon Monoxide.** *Biochimica et Biophysica Acta* 207(3):404-412, 1970.

Kinetics and equilibrium of the reaction of crystalline, polymeric lamprey hemoglobin with CO are reported. The A8, C and E type of crystals used in this study of the liganded form and that of deoxy–lamprey hemoglobin are all isomorphous. Equilibration with CO has shown the sigmoid shape of the curve, and heme–heme interaction. Thus the crystalline lamprey hemoglobin has demonstrated for the first time that quaternary conformational changes of the subunits of oxy- and deoxy-hemoglobin are not necessary for heme–heme interaction. Similarly, association–dissociation phenomena observed in the solution with the lamprey hemoglobin did not appear to be significant in the heme–heme interaction. (Auth. Abs.)

71-0574. Scherbak, M. P., Smith, T. A. **A Colorimetric Method for the Determination of Total Oxides of Nitrogen in Cigarette Smoke.** *Analyst* 95(1136):964-968, November 1970.

A method is described for determining the oxides of nitrogen present in tobacco smoke. Components of the vapor phase of smoke are trapped on charcoal. The trap is eluted with sodium hydroxide solution and the oxidation products of nitric oxide appear as nitrite and nitrate salts. An ion-exchange technique is used to release and purify the free acids by removing excess of alkali. They are then neutralized, made just alkaline and evaporated to dryness. The residual salts are dissolved in sulfuric acid iron (II) sulfate is added, and the absorbance of the pink complex is measured. The equivalent concentration of oxides of nitrogen is determined from a calibration graph obtained with nitrate standards. The method overcomes some of the problems of those reported previously, in that it determines both major products of oxidation of nitric oxide in smoke, and avoids the use of nitric oxide gas to prepare standards. Results have been compared with those obtained from separate determinations of the amounts of nitrite and nitrate formed by oxidation of the nitric oxide. All results are computed and reported as nitric oxide. The method has a coefficient of variation of 5.2 percent. (Auth. Abs.)

71-0575. Tibbling, L. **Smoking and Coronary Disease (16): Central Nicotine Effect–Stress Factor?** Complete English translation of "Rokning och Koronarsjukdom (16): Central Nikotineffekt–Stressfaktor?", *Lakartidningen* 67(3):282-283, January 14, 1970.

See Abstract 70-0579.

71-0576. U.S. Department of Health, Education, and Welfare. Public Health Service. **Marihuana and Health. A Report to Congress From the Secretary, U.S. Department of Health, Education, and Welfare.** U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration, National Institute of Mental Health, Washington, D.C., March 1971, 100 pp.

This report to the Congress summarizes the current state of knowledge concerning marihuana usage and its effects on man and begins with a description of the various natural and synthetic forms of the material and their chemistries. The extent and patterns of marihuana use and abuse are discussed in terms of the scope of the problem in the U.S., estimates of its use, its use by out-of-school adults, graduations of use, socio-demographic characteristics of users, attitudes and interests of users, initiation and source of supply, and its use in other countries. Preclinical animal studies on marihuana toxicity, central nervous system effects, autonomic and cardiovascular effects, respiratory effects, hypothermic effect, hormonal effects, antibiotic activity, interaction with other drugs, neurophysiological effects, behavioral effects, teratologic effects and metabolic effects are detailed. Therapeutic uses are reviewed followed by a detailed description of the acute and chronic effects of marihuana as determined by experiments on humans, and of the health consequences for the user. Social and cultural concomitants of marihuana use and an indication of future research needs and directions are outlined.

71-0577. U.S. Department of Health, Education, and Welfare. Public Health Service. **Survey of Lead in the Atmosphere of Three Urban Communities.** U.S. Department of Health, Education, and Welfare, Public Health Service, Environmental Health Service, National Air Pollution Control Administration, Raleigh, North Carolina, Public Health Service Publication No. 999-AP-12, Environmental Health Series, April 1970, 94 pp.

From June 1961 through May 1962 some 3400 samples of particulate lead from the atmosphere were obtained at 20 sites in Cincinnati, Los Angeles and Philadelphia. Lead in the blood and urine of selected groups of persons in the populations of these cities as well as atmospheric lead concentrations in heavy traffic and in a vehicular tunnel were also sampled. The annual average concentration of atmospheric lead ranged from 2 micrograms/m^3 of air in the downtown and industrial area of Cincinnati to about 1 in outlying areas. Values for corresponding areas in Philadelphia ranged from 3 to 1, and in Los Angeles from 3 to 2. The average lead concentration in all samples in each city was 1.4 micrograms/m^3 in Cincinnati, 1.6 in Philadelphia and 2.5 in Los Angeles The highest lead concentrations occurred during autumn and winter; during the day, highest concentrations occurred in the early morning. Mean lead concentrations in heavy traffic ranged from 14 to 25 micrograms/m^3 on Cincinnati streets and Los Angeles freeways to 44 micrograms/m^3 in a vehicular tunnel. Blood lead concentration in 2300 individuals was determined as was that in the urine of 1700 males within the same groups. These individuals included groups selected because of their apparent exposure to different amounts of lead in the ambient air in which they lived and worked, groups representative of occupations that provided an opportunity for lead exposure, and groups selected because they had certain chronic diseases that might conceivably affect their ability to dispose of lead. Only 11 persons were found with blood lead concentrations equal to or in excess of 0.06 mg/100 g blood. Levels of lead concentration in the urine were within normal limits. No relationship was found between levels of lead in the blood and age. Levels in females were slightly lower than those in males from comparable groups. In nearly all instances, the mean concentration of lead in the blood of smokers was slightly higher than that of nonsmokers. There were no unusual findings among persons investigated because of chronic diseases. Persons who lived and worked in rural or suburban areas had the lowest blood lead concentrations and it was in these areas that the lowest atmospheric lead concentrations were found. Highest blood lead levels occurred in groups who worked (and in some cases lived) in areas with higher lead concentrations. These results generally confirm earlier findings based on more limited observations.

71-0578. Yoshida, D. **Tabako no Kemuriju Taruryo ni Oyobosu Kosaku Joken no Eikyo. VI. Kemurijo Taruryo ni Eikyo wo Oyobosu Tabako no Naiyo Seibun. [Effects of Cultural Practices on the Tar Content in the Smoke of Cigarettes. VI. Effects of Chemical Components in the Cigarettes on the Tar Contents.]** *Hatano Tabako Shikenjo Gyotei Hokoku* 68:9-18, 1970, Japanese.

The effects of the chemical constituents in cigarettes on the tar content of the smoke were studied. The cigarettes were made from leaves which varied with respect to maturity, curing methods used (flue or air cured) and variety (Bright Yellow and Matsukawa). The components analyzed included nicotine, total sugars, total nitrogen, starch, chlorogenic acid, lignin, cellulose hemicellulose, pectin, alcohol-benzene extract, alcohol-benzene extract minus sugars, hexane extract, ether extract, acetone extract, 80 percent ethanol extract, hot water extract, and hot water extracted residue. Tar content in the smoke increased with maturity of the leaf and was higher with upper leaves than with middle leaves. Content of nicotine, alcohol-benzene extract and alcohol-benzene extract minus sugars showed the same tendencies as tar content. Tar content in the smoke showed a high correlation with contents of nicotine and alcohol-benzene extract minus sugars in the cigarettes. Percentages of radioactivity transferred from the radioactive alcohol-benzene extract mixed in the cigarettes to the tar by smoking were higher in comparison with that from the residue of the alcohol-benzene extract. Content of alcohol-benzene extract in the tobacco leaves were appreciably higher (15 to 30 percent in the dry matter). Therefore, it is assumed that the alcohol-benzene extract in the cigarette plays an important role in the formation of tar in the smoke. (Auth. Abs. Mod.)

71-0579. Zetler, G. **Pharmacological Differentiation of "Nicotinic" and "Muscarinic" Catalepsy.** *Neuropharmacology* 10(3):289-296, May 1971.

A cataleptic state was produced in mice by nicotine, arecoline, lobeline, pilocarpine, tremorine, bulbocapnine, trifluoperazine, haloperidol, and paraoxon. Unwanted peripheral actions were prevented by specific antagonists' not penetrating the blood–brain barrier; hexamethonium against nicotine and lobeline; methylatropine against arecoline, pilocarpine, and tremorine; pralidoxime against paraoxon. No catalepsy was achieved with cytisine, coniine, and dimethylphenylpiperazinium (DMPP). Atropine and scopolamine were the anticataleptic drugs of lowest specificity for they antagonized all cataleptogens. Specificity was highest with pempidine which was active only against nicotine. Mecamylamine antagonized nicotine, arecoline, and lobeline. Sparteine was anticataleptic against nicotine, arecoline, lobeline, pilocarpine, and tremorine. The catalepsy due to neuroleptics, bulbocapnine, and paraoxon was resistant to sparteine, mecamylamine, and pempidine. It is concluded that nicotinic and muscarinic steps are involved in cholinergic neurological processes promoting catalepsy. As in earlier experiments, hypothermia and catalepsy were found to be independent phenomena. (Auth. Abs.)

See also, **71-0583, 71-0602, 71-0675, 71-0678, 71-0700**

MORTALITY AND MORBIDITY

71-0580. Benckert, A., Lindholm, B. **Socio-Economic Consequences of Smoking.** Complete English translation of "Samhallsekonomiska Konsekvenser av Rokning. Rokningens Samhallsekonomiska Konsekvenser", *Social-Medicinsk Tidskrifts* 2(Special No.):91-95, February 1971.

An estimation of the socio-economic costs for damage to health stemming from cigarette smoking during 1967 is presented. Three different alternatives in calculating these costs yield estimates of 88, 257, or 686 million kroner. The calculations are based on the fact that smoking constitutes a serious health problem and therefore a socio-economically expensive habit. Great economic resources would be released if measures were initiated to limit the damaging effects of smoking.

71-0581. Lanfranco, A. **Smoking and Disease.** *St. Luke's Hospital Gazette* 5:181-186, December 1970.

Beginning with a historical discussion of the development of the smoking habit, and the first steps taken by international health organizations to warn against the hazards of smoking, a brief summary is presented of comparative morbidity studies and research findings which link smoking to many specific diseases, among them pulmonary and cardiovascular disorders. Legislative action which has been taken in several countries banning the advertisement of cigarettes on radio and television, and several preventive measures which have been suggested for the purpose of reducing tobacco consumption are outlined.

71-0582. Wolff, G., Lauter, J. **Statistische Beziehungen zwischen epidemiologischen Daten. [Statistical Relationship Between Epidemiological Data.]** *Zeitschrift fur die gesamte Hygiene und ihre Grenzgebiete* 17(2):127-134, February 1971, German.

A total of 776 outpatients of a tumor clinic, among them 261 healthy patients and 200 cancer patients, were epidemiologically interviewed. Numerous genetic and environmental factors, such as place of birth, residence, body weight, smoking habit, alcohol consumption, diabetes, dental diseases, blood-group, former diseases, number of brothers and sisters, etc. were recorded. The statistical correlation of all factors were ascertained. The correlation coefficients calculated (product moment) yielded a great number of statistically significant relations between the factors investigated. The smoking habit was most prominent among the cancer patients; 70 percent of the cancer patients had bronchial carcinomas.

See also, **71-0555**

NEOPLASTIC DISEASES

71-0583. Baumslag, N., Keen, P., Petering, H. G. **Carcinoma of the Maxillary Antrum and its Relationship to Trace Metal Content of Snuff.** *Archives of Environmental Health* 23(1):1-5, July 1971.

Social habits and customs are related to different disease patterns. Snuff inserted in the nares has been shown to be associated with the incidence of antral carcinoma in the Bantu. Carcinoma of the maxillary antrum constitutes 45.5 percent of all the respiratory tract cancers in the Bantu. A pilot study was conducted to examine the trace metal content in samples of Swazi snuff by atomic absorption spectrometry. The metals analyzed were zinc, chromium, copper, lead, nickel, and cadmium. Samples of soot from Swazi huts were also analyzed for the same metals. The Swazi snuff showed high concentrations of nickel, chromium, and zinc. Since nickel and chromium in some forms are known carcinogens, the association between carcinoma of the maxillary antrum and snuff may be prevented if the source of trace metal contamination is eliminated. (Auth. Abs.)

71-0584. Bulay, O. M. **The Study of Development of Lung and Skin Tumors in Mice Exposed *In Utero* to Polycyclic Hydrocarbons.** *Acta Medica Turcica* 7(1):3-38, 1970.

The study was conducted to determine whether carcinogenic effects occur *in utero* in the progeny of animals exposed to polycyclic hydrocarbons during pregnancy. This has been accomplished in experiments in which caesarean section foster fed offsprings were studied. Two experimental carcinogenesis systems have been studied. The first is the formation of pulmonary adenomas and the second is initiation of skin papillomas. Two carcinogens, benzo(*a*)pyrene (BP) and 7,12-dimethylbenz(*a*)anthracene (DMBA), were used. *In utero* carcinogenic effects on lung and skin occurred with both carcinogens but were produced to a greater degree with DMBA. *In utero* carcinogenic effects could be produced by either intraperitoneal or by subcutaneous injections of carcinogen into the mothers. A secondary contribution of the study was the demonstration for the first time that initiation of skin papillomas can be produced in the fetus. The following conclusions are suggested from the studies: 1) Transplacental passage of polycyclic hydrocarbon carcinogens occurs in sufficient amounts to produce carcinogenic effects *in utero* and to a greater degree than would be anticipated from a review of the literature. 2) BP, a moderately potent carcinogen, causes an enhancement of pulmonary adenoma formation in mice exposed to this carcinogen *in utero.* 3) BP also causes the initiation of skin papillomas *in utero.* 4) DMBA, a more potent carcinogen than BP, has a greater effect *in utero* as seen by an early occurrence of skin papillomas in large numbers. 5) Increasing doses of polycyclic hydrocarbon cause an enhanced carcinogenic response in the offsprings. 6) The occurrence of a slightly lower tumor incidence in offsprings allowed to nurse on their mothers which had been injected with BP as compared to offsprings delivered by caesarean section suggest that milk and excreta of mothers injected with polycyclic hydrocarbon carcinogens has little effect in causing tumors in the progeny. 7) The possibility that caesarean section has an enhancing effect on formation of pulmonary adenoma exists but requires confirmation. (Auth. Abs. Mod.)

71-0585. Carlens, E. **Harmful Clinical Effects of Smoking. Smoking and Cancer of the Respiratory Passages.** Complete English translation of "Medicinska Skadeverkningar av Rokning. Rokning och Cancer i Luftvagarna", *Social-Medicinsk Tidskrifts,* 2(Special No.):71-73, February 1971.

A brief survey of recent research findings concerning the relationship of smoking and lung cancer is presented. Primary emphasis is given to a study by Hammond and Auerbach who have been able to provoke lung cancer in dogs using cigarette smoke. Their results showed that of 14 dogs smoking 7 cigarettes a day (heavy smokers), 2 died with typical lung cancer before two years. Of the remaining 12 which were sacrificed, 8 had advanced cancer and the other 4 had cancer in the initial stage. The microscopic analysis of the cancers revealed them to be the same as found in cigarette smoking humans.

71-0586. Feinstein, A. R. **Smoking and Cancer Morphology. (Letter)** *Journal of the American Medical Association* 213(1):131, July 6, 1970.

An apology is made for the premature publication of a study on cigarette smoking and histological morphology in patients with lung cancer which interpreted the preliminary results as indicating that heavier smoking caused greater degrees of malignancy in lung cancer. The study's base population consisted of patients with lung cancer and not a general group of smokers and nonsmokers, and although increased smoking rates were associated with increased rates of undifferentiated small cell cancers, such cancers were not the most clinically malignant tumors found. In this study, epidermoid carcinoma, generally regarded as a "cigarette smoker's cancer", was present in four nonsmokers and the rate of this carcinoma showed no increase in association with increased smoking rates in the 449 patients studied.

71-0587. Gajaraj, A., Johnson, T. H., (Jr.), Feist, J. H. **Roentgen Features of Giant Cell Carcinoma of the Lung.** *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine* 111(3):486-491, March 1971.

Twelve cases of giant cell carcinoma of the lung were studied in retrospect. The roentgen features were correlated with the clinical and autopsy findings. The clinical, autopsy and available radiologic data of 51 other cases reported in the literature were also analyzed and studied to assess the size, location, and the local or distant spread. The tumor was found to be common in males (85 percent) and in smokers (76.2 percent). Its peripheral location, early hematogenous metastasis and a comparatively rapid growth, resemble adenocarcinoma; but the male preponderance, relationship to smoking and frequency of pleural involvement help to differentiate it. Thus, giant cell carcinoma of the lung has a few specific roentgen features which distinguish it from other pulmonary neoplasms.

71-0588. Garcia, G., De Acosta, V. M., Algorri, I. **Cancer de la Laringe. [Cancer of the Larynx.]** *Gaceta Medica de Mexico* 101(3):331-334, March 1971, Spanish.

The relationship of three different components of the tobacco habit–age the habit began, duration of habit and intensity of habit–to laryngeal carcinoma was investigated in 149 cases using multiple regression and correlation analysis. The analysis showed that the most important coefficient was the duration of habit, followed by age habit began and intensity of habit. However, the data used were elements extrinsic to the patient with no consideration of the individual's genetic susceptibility to carcinogenic agents. The therapeutic criteria and results obtained using surgery and radiotherapy are described. The survival rate at five and ten years is shown in relation to the different laryngeal and laryngopharyngeal cancer sites in patients treated exclusively with radiotherapy.

71-0589. Guleria, J. S., Gopinath, N., Talwar, J. R., Bhargava, S., Pande, J. N., Gupta, R. G. **Bronchial Carcinoma–An Analysis of 120 Cases.** *Journal of the Association of Physicians of India* 19(3):251-255, March 1971.

The clinical features and methods of diagnosis in 120 patients with bronchial carcinoma at the All India Institute of Medical Sciences Hospital, New Delhi, India are described. The patients included 70 smokers, 35 nonsmokers, and 15 in whom the smoking history was not recorded. Heavy and prolonged smoking was an obvious important causative factor in these cases. Since early detection of bronchial carcinoma is considered essential for a cure, it is suggested that the following high risk individuals be submitted to clinical and radiological examination of the chest and exfoliative cytological examination of the sputum at frequent intervals: 1) heavy and long-term smokers, 2) patients with chronic bronchitis of several years duration, and 3) all males above the age of 50 years.

71-0590. Jussawalla, D. J., Deshpande, V. A. **Evaluation of Cancer Risk in Tobacco Chewers and Smokers: An Epidemiologic Assessment.** *Cancer* 28(1):244-252, July 1971.

A retrospective study of cancer at high risk sites in the region of the head and neck was undertaken at the Bombay Cancer Registry, in 1968, to evaluate the effects of tobacco when chewed or smoked. There is sufficient evidence available today to indict chewing and smoking of tobacco as factors of great importance in the etiology of oral, pharyngeal, laryngeal, and esophageal cancers––the most common sites affected by the disease in Greater Bombay. This cause/effect association is probably as intimate as that of cigarette smoking and lung cancer. The carcinogenic action of chewed tobacco is particularly evident at those sites where the bolus is retained in place for any length of time. Likewise, inhalation of tobacco fumes during the act of smoking produces a stream of gas and of solid particles which impinges directly on the oropharynx and especially on the soft palate initially and exposes smokers to the increased risk of developing cancer at exactly these posterior sites in the oropharynx, rather than more anteriorly in the oral cavity where the tissues do not directly bear the brunt of the onslaught from the smoke. It is revealing to find that the high risk sites involved in tobacco chewers appear to be the least affected in smokers, and vice versa. (Auth. Abs.)

71-0591. Larsen, K. A. **Smoking and Pulmonary Disease (1): Pathological Anatomy and Pathogenic Factors.** Complete English translation of "Rokning och Lungsjukdom (1): Patologisk Anatomi og Patogenetiske Faktorer", *Lakartidningen* 67(4):375-383, January 21, 1970.

See Abstract 70-1234.

71-0592. Laurie, W., Szaloky, L. G. **Sputum Cytology in the Diagnosis of Bronchial Carcinoma.** *Medical Journal of Australia* 1(5):247-251, January 30, 1971.

An assessment is made of the relative values of several methods of investigation used in establishing the diagnosis in 500 consecutive cases of bronchial carcinoma. In convenience, cost and accuracy, sputum cytology far outweighs the results of other methods of investigation, showing 91.7 percent positive findings for those patients from whom specimens of sputum were received. Attention is drawn to the gravely increasing incidence of bronchial carcinoma, which seems to be doubling every five years. In the face of government apathy towards the control of cigarette smoking, there is no hope of reversing this trend in the foreseeable future, and the only hope of improving the present grim prognosis for the individual patient is by much earlier diagnosis. It is suggested that this is feasible by the use of sputum cytology surveys in high-risk populations.

71-0593. Leuchtenberger, C., Leuchtenberger, R. **Influence of Chronic Inhalation of Fresh Cigarette Smoke and Its Gas Phase on the Development of Lung Tumors in Snell's Mice.** Complete English translation of "Einfluss chronischer Inhalationen von frischem Zigarettenrauch und dessen Gasphase auf die Entwicklung von Lungentumoren bei Snell's Mausen", *Zeitschrift fur Praventivmedizin* 17(6):457-462, November-December 1970.

Chronic inhalation of whole smoke as well as of its gas phase by Snell's mice led to the early and increased incidence of lung tumors in which the influence of the gas phase was especially noteworthy. The effect in the male mice was stronger than in the female mice. Bronchogenic carcinomas such as occur frequently in human cigarette smokers were never observed in the mice. Rather, after inhalation of the whole smoke or of the gas phase, only glandular tumors were observed. Such tumors are of a histological type which also occurs occasionally in the controls and then only at a later age.

71-0594. McNelis, F. L., Esparza, A. R. **Carcinoma *In Situ* of the Larynx.** *Laryngoscope* 81(6):924-930, June 1971.

Carcinoma *in situ* of the larynx has been found to be a disease entity that is being recognized more frequently at the Rhode Island Hospital. Of 14 cases of carcinoma *in* *situ* diagnosed during the 1966-1970 period, all but one were male, all were smokers, and the ages ranged from 45 to 72, with 50 percent being in the sixth decade. The technique of microlaryngoscopy with biopsy of the areas retaining Toluidine blue, plus the recognition of varying degrees of differentiation of carcinoma *in situ* were held responsible for this increase. Treatment is discussed, but best modality has not yet been determined. Utilization of the TNM system of stage 0 for carcinoma *in situ* in lesions of the larynx is proposed.

71-0595. Neutel, C. I., Buck, C. **Effect of Smoking During Pregnancy on the Risk of Cancer in Children.** *Journal of the National Cancer Institute* 47(1):59-63, July 1971.

From the Ontario Perinatal Mortality Study and the British Perinatal Mortality Survey, 89,302 babies surviving at least 7 days served as a base population for a prospective study of the relationship between smoking in pregnancy and cancer in the offspring. The smoking habits of the mother during pregnancy were recorded before or just after the birth of the child. In the two base populations combined, there were 65 cancer deaths and 32 cancer survivors in the period from birth to a minimum of 7 and a maximum of 10 years of age. For cancer of all sites, the children of smokers had a relative risk of 1.3 with 95 percent confidence limits of 0.8–2.2. Evidence of a dose-response relationship was lacking. Although these results make it most unlikely that *in utero* exposure to tobacco smoke has a broadly carcinogenic effect on the fetus, a response confined to one tissue or expressed over a narrow age range cannot be ruled out. (Auth. Abs.)

71-0596. Paymaster, J. C., Gangadharan, P. **The Problem of Gastro-Intestinal Cancer in India.** *Indian Practitioner* 24(1):7-15, January 1971.

The incidence of cancer in the gastro-intestinal tract varies from country to country and sometimes within the country. A high incidence of cancer of the esophagus is observed in India, whereas cancer of the stomach, colon and rectum have a low rate in our country. Cancer of the anal canal has a high frequency rate in India. Certain habits like smoking and chewing pan are associated with cancer of the upper two-thirds of the esophagus. Differences in the distribution of cancers of the gastro-intestinal tract observed between the various communities of Western India are presented. (Auth. Abs.)

71-0597. Pearce, M. L., Dayton, S. **Incidence of Cancer in Men on a Diet High in Polyunsaturated Fat.** *Lancet* 1(7697):464-467, March 6, 1971.

In an eight-year controlled clinical trial of a diet high in polyunsaturated vegetable oils and low in saturated fat and cholesterol in preventing complications of atherosclerosis, 846 men were assigned randomly to a conventional diet or to one similar in all respects except for a substitution of vegetable oils for saturated fat. Fatal atherosclerotic events were more common in the control group (70 vs. 48; $P < 0.05$). However, total mortality was similar in the two groups: 178 controls vs. 174 experimentals, demonstrating an excess of non-atherosclerotic deaths in the experimental group. This was accounted for by a greater incidence of fatal carcinomas in the experimental group. Thirty-one of 174 deaths in the experimental groups were due to cancer, as opposed to 17 of 178 deaths in the control groups ($P = 0.06$). An analysis of smoking habits showed a higher frequency of carcinoma deaths in the experimental group; there was no non-dietary explanation for this.

71-0598. Stavraky, K. M., **A Study of Precursor Illness in Lung Cancer Patients.** *Journal of Chronic Diseases* 23(10/11):691-705, March 1971.

This study was attempted to demonstrate differences occurring years prior to death in the illness histories of a group of men dying of lung cancer and a group of controls dying of other causes but matched to the cases for age, place of residence, occupation and cigarette smoking. It was postulated that differences in illness patterns present long enough prior to death to be evident before symptoms of lung cancer emerged, might be useful in predicting which smokers will subsequently develop lung cancer. Histories of hospitalized illnesses for the 12-year period prior to death of case or control were obtained for 526 veteran pensioners who died of lung cancer and 526 matched controls dying of other causes. Analysis of these histories did not support the hypothesis that illness patterns present prior to death from lung cancer might be predictive of those smokers who are susceptible to lung cancer. The results did suggest that minor differences in illness patterns between cases and controls are related to the smoking habit and the tendency for lung cancer patients to smoke more intensely (as measured by amount and duration of smoking) than controls who smoke the same number of cigarettes. (Auth. Abs.)

71-0599. Stuart, B. O., Willard, D. H., Howard, E. B. **Studies of Inhaled Radon Daughters, Uranium Ore Dust, Diesel Exhaust, and Cigarette Smoke in Dogs and Hamsters.** Battelle Memorial Institute, Pacific Northwest Laboratory, BNWL-SA-3419:12 pp, 1970.

In the present continuing experiments, daily six-hour exposures of groups of 100 hamsters to either 30 working levels (WL) of radon daughters, 600 WL of radon daughters with 15 mg/m^3 uranium ore dust (carnotite), or laboratory air (controls) have been underway for 19 to 23 months. After 6 months or more of exposures, hamsters receiving 600 WL radon daughters or 600 WL radon daughters with 15 mg/m^3 uranium ore dust showed lung changes including edema, emphysema, and occasionally hyperplasia and metaplasia of the bronchiolar epithelium. Several of the animals exposed to 600 WL radon daughters with the uranium ore dust seem to have developed changes in the bronchiolar epithelium suggestive of early tumor formation after 14 months of exposures. Mortality, body weight and hematology studies have shown no significant differences between experimental groups and controls. These findings indicate that other mine air contaminants, in this case carnotite ore dust, may contribute to the development of several types of respiratory tract pathology, including neoplasia, and that an experimental protocol of daily long-term exposures at levels that do not produce lifespan shortening may be necessary to produce these effects. Continuing experiments also involve life-span exposure of hamsters to diesel exhaust with and without 600 WL radon daughters plus ore dust, to determine whether this agent is capable of a contributory or synergistic action in the observed precancerous and probable cancerous lung pathology. Sixty-nine beagle dogs have been placed on daily life-span exposures. Forty dogs in two groups are smoking 10 cigarettes over a 16-hour period daily, seven days per week. Forty dogs are receiving daily 4-hour head-only exposures to 600 WL of radon daughters with 15 mg/m^3 of uranium ore dust. No significant biological effects of these exposures have been observed after six months of exposures, although transient changes have been observed in respiratory rates and volumes of individual exposed animals. Physical and radiological examinations and hematology studies on all dogs are continuing on a program of lifetime daily exposures.

71-0600. Trendelenburg, F., Mall, W. **Epidemiologie und Entdeckung des Bronchialcarcinoms. [Epidemiology and Detection of Bronchial Carcinomas.]** *Internist* 11(9):303-317, September 1970, German.

Mortality statistics for bronchial carcinoma in various countries are presented and the endogenous and exogenous factors reviewed. The influence of cigarette smoking, especially with inhalation of the smoke, on the development of bronchial carcinoma is cited by various authors. One author found 1.0 percent of current smokers cytologically positive as against 0.35 percent of nonsmokers and 0.47 percent of ex-smokers. Another study of 1586 male smokers above 40 years of age, revealed 11 cases (malignant cells in the sputum) not detected by X-ray examination alone. A combined cytological and X-ray program can reveal 90 percent of all lung cancer malignancies. Recommended preventive measures include public information on the harmfulness of cigarette smoking, antismoking campaigns among juveniles and adult smokers, public awareness of the early symptoms of lung cancer, and the instruction and involvement of physicians, medical students and health personnel in antismoking measures.

71-0601. Tyrrell, A. B., MacAirt, J. G., McCaughey, W.T.E. **Occupational and Non-Occupational Factors Associated With Vesical Neoplasm in Ireland.** *Journal of the Irish Medical Association* 64(410):213-217, April 22, 1971.

In a survey of occupational and non-occupational factors associated with vesical neoplasm in the Republic of Ireland, there was no evidence of a significant association with occupation or environment. There was evidence of a significant relationship between smoking and the disease, but an association with the duration and intensity of such smoking was not demonstrated. (Auth. Abs.)

71-0602. Van Duuren, B. L., Sivak, A., Katz, C., Melchionne, S. **Cigarette Smoke Carcinogenesis: Importance of Tumor Promoters.** *Journal of the National Cancer Institute* 47(1):235-240, July 1971.

The tumor-promoting activity of tobacco smoke condensate was examined by skin application in ICR/Ha Swiss mice. One application of 50 micrograms 7,12-dimethylbenz(*a*)anthracene (DMBA) was followed 2 weeks later by 5 times weekly application of 40 mg tobacco smoke condensate. After 573 days, 36 of 60 mice bore papillomas; 14 bore carcinomas. In a group receiving condensate only, 18 of 60 mice bore papillomas; 4 bore carcinomas. There were 8 mice with papillomas after a single dose of DMBA and repeated application of acetone. These findings reaffirm that tobacco smoke condensate is primarily a tumor-promoting agent with weak carcinogenic activity. Application of 20 micrograms DMBA, followed by thrice weekly application of 5 micrograms benzo(*a*)pyrene (BaP), resulted in 21 of 30 mice with papillomas and 11 with carcinomas after 462 days on test. BaP application alone at the same dose resulted in 8 of 20 mice with papillomas and 1 with a carcinoma, suggesting that the carcinogen BaP has a "promoting-like" effect after application of an initiating agent. (Auth. Abs.)

71-0603. Weiss, W., Boucot, K. R., Cooper, D. A. **The Philadelphia Pulmonary Neoplasm Research Project. Survival Factors in Bronchogenic Carcinoma.** *Journal of the American Medical Association* 216(13):2119-2123, June 28, 1971.

During a ten-year prospective study of 6,136 men aged 45 and older, screened every six months by 70-mm photofluorograms and questionnaires, 121 men who did not have lung cancer visible on the entry film developed lung cancer; 94 cases were proved histologically. The overall survival rate was 8 percent at five years. From a study of various factors in the 94 proved cases, the profile of the men most likely to survive five years includes: age less than the median of 64 years, smoking one pack of cigarettes per day or less, absence of chronic cough prior to detection, a histologic type of squamous cell carcinoma or adenocarcinoma, a roentgenogram of the chest negative for cancer within 12 months before detection of the cancer, and resectability of the cancer with survival longer than 30 days after surgery. (Auth. Abs.)

71-0604. Yoshida, O. **Bokogan ni Kansuru Kenkyu. I. Nihonjin Bokogan no Tokeiteki oyobi Ekigakuteki Kenkyu. [Studies on Carcinoma of the Urinary Bladder. I. Statistical and Epidemiological Studies on Cancer of the Bladder in Japanese.]** *Acta Urologica Japonica* 12(10):1040-1064, October 1966.

Of 163 males with bladder cancer, 150 or 92 percent smoked as compared with 126 or 77.3 percent of 163 controls. Of 29 females with bladder cancer, 11 or 37.9 percent smoked as compared to 8 or 13.6 percent of 59 controls. Both these differences are significant by the chi-squared test. The relative risk for males was 3.35 and for females 3.8. Of the 150 male smokers with bladder cancer, 65 or 43.4 percent were heavy smokers as compared to 42 or 33.3 percent of 126 controls; 62 or 41.3 percent were medium smokers as compared to 40 or 31.8 percent of the 126 controls; and 23 or 15.3 percent were light smokers as compared to 44 or 34.9 percent of the 126 controls. These differences are also significant by the chi-squared test. Histological studies of 42 of the 65 heavy smokers with bladder cancer showed 41 cases of transitional cell cancer and 1 case of squamous cell cancer.

71-0605. Zacho, A., Nielsen, J., Larsen, V., Cederqvist, C. **Intolerance of Tobacco in Patients With Gastric Cancer.** *Acta Chirurgica Scandinavica* 137(3):277-278, 1971.

A total of 221 patients with gastric cancer (157 men and 64 women) were questioned in detail concerning their smoking habits. Ninety-one percent of the men and 48 percent of the women had been regular smokers. Sixty-seven percent of the male and 68 percent of the female smokers had stopped or reduced their smoking prior to their admission to a hospital, especially during the last year before admission. The most common reason was that tobacco no longer tasted good or that it actually disagreed with them. This factor must be taken into consideration in statistical studies on the etiological role of tobacco in gastric cancer. (Auth. Abs.)

See also, **71-0555, 71-0582, 71-0625, 71-0690**

NON–NEOPLASTIC RESPIRATORY DISEASES

71-0606. Albert, R. E. **Bronchial Clearance Abnormalities in Man Produced by Cigarette Smoke and Lung Disease.** *Chest* 59(5, Supplement):3S, May 1971.

Tests were conducted to determine whether discrete waves discharged from the trachea of subjects who inhaled two different sized aerosols separated by a time interval were due to: 1) deposition in the same discrete areas of the lung for both aerosols, with a uniform rate of mucus flow; or 2) a uniform pattern of particle deposition associated with an intermittent flow of mucus. Results showed that the timing of the clearance waves was determined by an intermittency in mucus movements in heavy smokers and normals. In some tests, both types of similarity were observed, indicating that discrete whole lung clearance waves can, in the same individual, be caused by different mechanisms.

71-0607. Aldas, J. S., Dolovich, M., Chalmers, R., Newhouse, M. T. **Regional Aerosol Clearance in Smokers and Nonsmokers.** *Chest* 59(5, Supplement):2S, May 1971.

The effects of a repeated smoking exposure on pulmonary clearance of inhaled aerosol was studied by following the retention of ^{131}I human serum albumin aerosol with respect to time in nine smokers who inhaled a cigarette every 15-20 minutes and in ten nonsmokers. Results showed that although overall clearance of activity from the lung was faster in smokers, the clearance rate in the large proximal airways was slower than normal, while that more peripherally was faster. This probably explains why there was a relative accumulation of activity in the perihilar region in many of the smokers at 1½-2 hours. The more rapid overall clearance in smokers is explained by the abnormal deposition, there being much less aerosol deposited on presumably non-ciliated airways, which emphasizes the importance of deposition pattern in determining clearance rates.

71-0608. Allen, G. W., Sabin, S. **Comparison of Direct and Indirect Measurement of Airway Resistance. A Critical Analysis of the Forced Vital Capacity Curve.** *American Review of Respiratory Disease* 104(1):61-71, July 1971.

The results of spirometric tests and specific conductance as measured by a body plethysmograph were compared in normal nonsmokers, normal smokers, and patients with obstructive pulmonary disease. The time required to expire the middle half of the forced vital capacity (FVC) correlated better with specific conductance than with forced vital capacity, one-second forced expiratory volume, the ratio of one-second forced expiratory volume to forced vital capacity, or maximal midexpiratory flow. Poorer correlations with time to expire the first and last quarters of forced vital capacity emphasize the effort-dependence of these portions of the forced vital capacity. Normal smokers demonstrated a significantly lower specific conductance than normal nonsmokers. The FVC and maximal midexpiratory flow demonstrated this difference spirometrically. The FVC is proposed as a simple and more accurate screening test for early detection of increased airway resistance. (Auth. Abs. Mod.)

71-0609. Anderson, W. H. **Acute Exposure to Cigarette Smoke as a Cause of Hypoxia.** *Chest* 59(5, Supplement):33S-34S, May 1971.

In this study, 16 patients with and 16 without chronic obstructive pulmonary disease (COPD) smoked, over a five-minute period, 6 cm of an unfiltered cigarette containing 27 mg tar and 1.9 mg nicotine. Smoking caused significant changes in average V/Q, as indicated by increased A-a gradient for oxygen, venous admixture and alveolar shunting of blood, and in eight subjects these changes caused a significant decrease in PaO_2. Preceeding smoking with mild exercise did not alter the response in either group. In six patients with COPD, smoking one cigarette increased carboxyhemoglobin from 4.26 to 5.36 percent. Three of these individuals showed a mean decrease of 1.1 L/minute in cardiac output. Thus, in some instances, smoking can result in a PaO_2 drop, an increase in carboxyhemoglobin, a leftward displacement of the oxyhemoglobin dissociation curve and a decrease in cardiac output, which significantly decreases O_2 delivery for cellular metabolism.

71-0610. Black, L. F., Hyatt, R. E. **Maximal Static Respiratory Pressures in Generalized Neuromuscular Disease.** *American Review of Respiratory Disease* 103(5):641-650, May 1971.

Maximal static respiratory pressures were determined by a simplified method in 15 patients of whom 10 had neuromuscular disorder alone and 5 had neuromuscular disease in addition to chronic obstructive lung disease or major airway obstruction. The former group included two smokers and the latter three smokers. The maximal static respiratory pressures were more frequently abnormal than vital capacity, maximal midexpiratory flow or maximal breathing capacity. This method detected muscle weakness even in the presence of coexistent intrapulmonary disease and was helpful in evaluating dyspnea in these patients. Early in the disease, the maximal static respiratory pressures can be abnormal even though the results of spirometry are normal.

71-0611. Brille, D. **Incidence of Chronic Bronchitis in Women. The Role of Tobacco.** Complete English translation of "Frequence de la Bronchite Chronique Chez la Femme. Role du Tabac", *Revue de Tuberculose et de Pneumologie* 33(6):794-797, 1969.

See Abstract 71-0077.

71-0612. Cohen, A. B., Cline, M. J. **The Human Alveolar Macrophage: Isolation, Cultivation** *In Vitro*, **and Studies of Morphologic and Functional Characteristics.** *Journal of Clinical Investigation* 50(7):1390-1398, July 1971.

Human alveolar macrophages were lavaged from surgically resected lungs and from lungs of normal subjects. Macrophages that had been purified by glass adherence were maintained in tissue culture for as long as 54 days. After 3–4 wk *in vitro* they underwent transformation into multinucleated giant cells. These aged cells had more than 30 times the phagocytic capacity that the same group of cells had had after 1 day *in vitro*. Phagocytosis of heat-killed *Candida albicans* was inhibited by iodacetate, sodium fluoride, potassium cyanide, and low partial pressures of oxygen, suggesting that these cells require both oxidative and glycolytic energy sources for maximal particle ingestion. Alveolar macrophages and monocyte-derived macrophages killed *Listeria monocytogenes* with similar efficiency, but neutrophils were more efficient than either of the other cell types. Bacterial killing is probably not dependent upon myeloperoxidase in the monocyte-derived macrophage or in the alveolar macrophage since histochemical stains for peroxidase do not stain either cell type. *C. albicans* blastospores, which are killed by neutrophils and monocytes that contain myeloperoxidase, were not killed by human alveolar macrophages during the 4-hr observation. Large cells with supernormal phagocytic capacity were recovered from patients with postobstructive pneumonia and from one patient with recurrent bacterial pneumonia, indicating that macrophage function can be altered in certain disease states. Human alveolar macrophages are unique human phagocytes in their dependence on an oxygen tension greater than 25 mm Hg for maximal phagocytosis. Carbon dioxide tensions as high as 70 mm Hg did not alter phagocytosis when the pH of the medium was held constant. These data suggest that the increased susceptibility to pneumonia of patients with chronic bronchitis of atelectasis may be in part related to suboptimal phagocytosis by macrophages in areas of the lung with depressed oxygen tension. (Auth. Abs.)

71-0613. Finklea, J. F., Hasselblad, V., Sandifer, S. H., Hammer, D. I., Lowrimore, G. R. **Cigarette Smoking and Acute Non-Influenzal Respiratory Disease in Military Cadets.** *American Journal of Epidemiology* 93(6):457-462, June 1971.

Acute upper and lower non-influenzal respiratory illness, but not enteric or traumatic illness, was significantly more frequent among cigarette smokers than nonsmokers. Outpatient and hospital acute upper respiratory incidence rates for heavy smokers (> one pack per day) were 1.3 times those of nonsmokers. Acute lower respiratory disease rates for heavy smokers were twice those of nonsmokers. In each case, both lighter cigarette smokers, and cigar, pipe and ex-smokers exhibited intermediate rates. An index of severity, the ratio of hospital incidence rates to outpatient rates, was similar for smokers and nonsmokers in each illness category. Cigarette smokers comprised 34.5 percent of the 1,848 volunteers in this study. (Auth. Abs.)

71-0614. Galy, P., Brille, D., Coudray, P., Israel-Asselain, R., Le Melletier, J., Michel, F. B., Migueres, J., Pham G. T., Voisin, C. **Colloques sur la Bronchite Chronique. I. Nosologie et Epidemiologie. [Symposium on Chronic Bronchitis. I. Nosology and Epidemiology]** *Revue de Tuberculose et de Pneumologie* 34(5):723-748, July-August 1970, French.

The symposium comprises various discussions and presentations of highlights from studies dealing with the nosology and epidemiology of chronic bronchitis. After defining anatomically the significance of the term chronic bronchitis and discussing the nosological border-line relationship of the disease with asthma and emphysema, the symposium deals with the epidemiology of chronic bronchitis based on several studies briefly presented by the various participating members. Specifically, these studies include research on the respiratory insufficiency in a sample population of men and women aged from 30 to 70 in Bordeaux, France, in whom the appearance of the different symptoms of the disease are statistically analyzed. The role of tobacco and the distribution of disease symptoms in smokers and nonsmokers are also discussed. Occupations are commented upon based on results from two studies: one dealing with workers from different factories and in differing environments, and one dealing only with coal miners. A bacteriological study is presented which indicates the role that bronchopulmonary infections play in chronic bronchitis. Viruses and predisposing factors for infection are commented upon. Endogenous factors and their role in chronic bronchitis also are discussed.

71-0615. Gauthier, H. **L'Insuffisance Respiratoire au Canada. [Respiratory Insufficiency in Canada.]** *Laval Medical* 41:992-994, October 1970, French.

A brief review of the etiology of non-tuberculous respiratory insufficiency is presented in which chronic bronchitis, emphysema, and lung cancer are discussed particularly with relation to cigarette smoking. Statistics which reflect the increased mortality due to respiratory diseases are presented for the United States and Canada.

71-0616. Hammarsten, J. F., Henderson, L., Guenter, C. A., Ferguson, S., Welch, M. H. **An Epidemiological Approach to Chronic Obstructive Pulmonary Disease and Alpha$_1$-Antitrypsin in Hospital Patients: A Tri-Racial Study.** *Transactions of the American Clinical and Climatological Association* 82:124-130, 1971.

In a population with high prevalence of smoking, chronic bronchitis, and obstructive lung disease, there was no difference in distribution of alpha$_1$-antitrypsin levels among the races. Whites had a significantly higher prevalence of chronic bronchitis and obstructive lung disease than Indians with Negroes occupying an intermediate position. This is attributed primarily to the heavier smoking habits in Whites; that is, to cultural patterns rather than genetic differences. (Auth. Abs.)

71-0617. Hardinge, M. **Effects of Smoking on Body Mechanisms.** *School Health Review* 2:5-7, April 1971.

The local effects of smoking on the respiratory tract are due primarily to the very fine particles of smoke acting directly on the lung tissue causing a narrowing or constriction of the air passages resulting in shortness of breath or severe difficulties in breathing. They also attack the important defense mechanism of mucous and ciliary activity along the length of the respiratory tract. The systemic effects of cigarette smoking are produced by absorbed substances, mainly nicotine, although carbon monoxide also strongly affects the cardiovascular system. Studies of large population groups show that smokers of both sexes and all age groups suffer more illness and death than nonsmokers. The risk of death is three times greater in men smoking 20 or more cigarettes a day than in nonsmokers. The logical approach to the reduction or elimination of the smoking problem is the education and motivation of the young to choose not to start smoking.

71-0618. Hook, H. L., Morrice, G. (Jr.), deTreville, R.T.P. **Fibrous Glass Manufacturing and Health. Results of a Comprehensive Physiological Study: Part II.** *Industrial Health Foundation* 44:103-111, 1970.

Results of a thorough medical evaluation of a randomly selected sample of employees working in the manufacturing the processing of fibrous glass, fail to show any evidence which would support a hypothesis that those with dusty jobs were less healthy than those with minimal dust exposure at work. A pulmonary function test of the older age group (over 50 years of age) was conducted, and a comparison was made between the greatest and least exposure groups in an attempt to identify any adverse bioeffects of dust exposure on the lungs. The smoking habits of each subject were also considered in analyzing his respiratory function. No evidence was found of a measurable 'dust effect' affecting ability to diffuse gases across the alveolar membrane in this employee group. It is concluded that fibrous glass dust inhaled and retained in the lungs has no associated morbid effect.

71-0619. Lawrence, J. S., Locke, G. B., Ball, J. **Rheumatoid Serum Factor in Populations in the U.K. I. Lung Disease and Rheumatoid Serum Factor.** *Clinical and Experimental Immunology* 8(5):723-739, May 1971.

In population samples in England and Wales a greater frequency of positive sheep cell agglutination tests has been found in Leigh and the Rhondda than in Wensleydale, the Vale of Glamorgan or Watford. The urban population of Leigh had more X-ray evidence of lung pathology than the rural population of Wensleydale. Seropositive persons in both the urban populations of Leigh and the Rhondda and the rural populations of Wensleydale and Glamorgan had more X-ray evidence of lung pathology than seronegative individuals, the difference being significant for healed tuberculosis of the lungs, thickened basal pleura and increased basal vascular markings. The association between the first two and rheumatoid factor was equally present in those with and without arthritis but in the third it was limited to those with arthritis. A history of bronchitis was no more common in persons with a positive sheep cell test than in those with a negative test and the indirect maximum breathing capacity showed no significant relationship to rheumatoid factor titer. No association was found between cigarette smoking and the sheep cell titer. It is concluded that parenchymal lung and pleural disease may act as a stimulus to the production of rheumatoid serum factor and that this stimulus is independent of the presence or absence of arthritis. (Auth. Abs.)

71-0620. Lourenco, R. V., Klimek, M. F., Borowski, C. J. **Deposition and Clearance of 2-Micron Particles in the Tracheobronchial Tree of Normal Subjects–Smokers and Nonsmokers.** *Journal of Clinical Investigation* 50(7):1411-1420, July 1971.

Deposition and clearance of inhaled particles of iron oxide labeled with ^{198}Au were studied in 19 normal subjects (10 nonsmokers and 9 smokers). For this purpose, monodisperse aerosols of particles with a 2-micron diameter were produced in a spinning disc atomizer. Thoracic counts and images with a scintillation camera were begun immediately after inhalation of the aerosol and continued for 6 hr. In all subjects, smokers and nonsmokers, the deposition of the particles was uniform throughout both lung fields, with approximately half of the particles deposited in the ciliated airways (tracheobronchial deposition) and half in the nonciliated airways (alveolar deposition). Tracheobronchial clearance in nonsmokers occurred immediately after inhalation, first at a fast rate for particles deposited in the largest and most central airways, and then at a slower rate for particles from the smaller and more peripheral airways. Photoscintigrams showed that the particles cleared steadily with no retention in any area. The general pattern of clearance may be likened to a model of multiple conveyor belts with speed increasing from the peripheral to the central airways in such a way as to prevent "particle jams" at airway confluence points. In smokers, tracheobronchial clearance was delayed for periods of 1–4 hr after inhalation. Furthermore, in contrast with the findings in nonsmokers, significant clearance was still occurring in many of the smokers in the 5th and 6th hr after inhalation. Also, photoscintigrams showed an abnormal accumulation of particles in the large airways several hours after inhalation of the aerosol. (Auth. Abs.)

71-0621. McLaughlin, R. F., Tueller, E. E. **Anatomic and Histologic Changes of Early Emphysema.** *Chest* 59(6):592-599, June 1971.

Most systems of classifying emphysema grade the according to type, distribution, and extent of involvement from barely visible onward. Clinical and anatomic evidence of progression in these lesions suggests the existence of earlier stages. Thirty-nine lungs were studied. All appeared grossly normal but contained widespread macroscopic foci of early centrilobular and panlobular emphysema. Numerous abnormal brownish pigmented alveolar macrophages were found in the adjacent, otherwise intact appearing parenchyma. They were not found in normal lungs. Identical pigmented macrophages were found in sputum specimens obtained from apparently healthy cigarette smokers. Frequency of occurrence appeared related to the number of cigarettes consumed. The brownish pigment resembled tobacco but could not be identified as such. In heavy smokers, many of these cells also contained iron particles, suggesting the possibility of tissue damage. Such cells are thought to produce proteases. Their occurrence prior to evidence of bronchiolar-alveolar destruction may be of particular significance in the various alpha$_1$-antitrypsin deficiency states. (Auth. Abs.)

71-0622. Miller, G. J., Ashcroft, M. T. **A Community Survey of Respiratory Disease Among East Indian and African Adults in Guyana.** *Thorax* 26(3):331-338, May 1971.

The belief that chronic bronchitis is more prevalent among Indians than Africans in the Caribbean area was investigated by a community survey in Guyana. Respiratory symptoms were assessed by a standard questionnaire, ventilatory capacities were measured, and chest radiographs were taken of some 800 African and Indian men and women aged 35 to 54 years living in adjacent and similar communities. Histories of morning cough, chronic cough, morning phlegm, and chronic phlegm (chronic bronchitis) were more common in Indians than Africans. Although these respiratory symptoms were much more common in smokers than nonsmokers, the higher prevalence rates in Indians could not be explained by smoking habits which were similar in the two races. Chronic bronchitis occurred in 17.3 percent of Indian and 2.4 percent of African male smokers and in 6.1 percent and 2.2 percent of Indian and African female nonsmokers, respectively. Judging by the history, lung function, and clinical signs, chronic bronchitis was more severe in Indians than Africans. The condition was more common among field laborers on sugar estates but, although the majority of field laborers were Indian, this occupational difference only partially explained the difference in prevalence between Indians and Africans. Indians, for reasons unknown, appear to have a greater susceptibility than Africans to chronic bronchitis. (Auth. Abs.)

71-0623. Mitchell, C. A., Gandevia, B. **Respiratory Symptoms and Skin Reactivity in Workers Exposed to Proteolytic Enzymes in the Detergent Industry.** *American Review of Respiratory Disease* 104(1):1-12, July 1971.

A survey of 98 workers in the detergent industry exposed periodically to high concentrations of proteolytic enzymes indicated that symptoms suggestive of asthma developed in 50 percent on exposure either within one-half hour, after four or five hours, or at night. Immediate (prick) and five-hour (intradermal) cutaneous reactions to the enzymes were not significantly more frequent in the symptomatic (72 percent and 44 percent, respectively) than in the asymptomatic subjects (56 percent and 24 percent). By contrast, there was a highly significant association between skin reactions to the enzyme and to three common inhalant allergens. With the exception of a history of food and drug allergy, a personal or family history of atopic manifestations did not influence the likelihood of development of symptoms, nor did smoking habit or current, clinical evidence of bronchitis. The findings suggest that symptomatic bronchial reactions in persons exposed to a potent sensitizing and chemically active material are determined by other factors in addition to allergy, at least as indicated by skin reactivity. Tests of ventilatory and diffusing capacity showed no evidence of permanent lung damage in sensitized or unsensitized subjects, whether symptomatic or not. (Auth. Abs.)

71-0624. Morgan, T. E. **Pulmonary Surfactant.** *New England Journal of Medicine* 284(21):1185-1193, May 27, 1971.

Recent advances in the knowledge of the pulmonary surfactant system are reviewed in terms of its physiology, alveolar morphology, chemistry and surfactant biosynthesis and turnover. The role of pulmonary surfactant in disorders such as the respiratory-distress syndrome of newborns, pulmonary arterial occlusion, pulmonary edema, pulmonary alveolar proteinosa and atelectasis is described. The effects on surfactant of changes in the gaseous environment such as occur under conditions of high concentrations of oxygen, hypoxia and hypercapnia, and of gaseous and particulate pollutants in inspired air are indicated. Also mentioned are the effects of surgical procedures, aspiration and drowning on pulmonary surfactants. The use of saline lavage of lungs and of aerosolized surface-active agents as therapeutic measures is discussed.

71-0625. Nasiell, M. **Smoking and Pulmonary Disease (2): Sputum Cytological Studies of Smokers.** Complete English translation of "Rokning och Lungsjukdom (2): Sputumcytologiska Studier av Rokare", *Lakartidningen* 67(4):384-389, January 21, 1970.

See Abstract 70-1259.

71-0626. Poppius, H. **Smoking and Pulmonary Disease (4): Clinico-Physiological Studies.** Complete English translation of "Rokning och Lungsjukdom (4): Kliniskt-Fysiologiska Studier", *Lakartidningen* 67(4):397-401, January 21, 1970.

See Abstract 70-1260.

71-0627. Pratt, S. A., Smith, M. H., Ladman, A. J., Finley, T. N. **The Ultrastructure of Alveolar Macrophages From Human Cigarette Smokers and Nonsmokers.** *Laboratory Investigation* 24(5):331-338, May 1971.

Alveolar macrophages were obtained by endobronchial lavage of cigarette smokers and nonsmokers and were examined with the electron microscope. The macrophages are characterized by surface processes, polymorphic nuclei, an extensive Golgi apparatus, cytoplasmic filaments, and various inclusions. The inclusions are membrane-bounded, are round to pleomorphic in shape, and show a moderately dense matrix. They contain acid phosphatase and are probably lysosomes and/or phagolysosomes. In nonsmokers the inclusions are mostly round or oval and measure from 0.1 to 2.0 microns in diameter. Many contain only matrix material, but others also possess round dense zones, lamellae, myelin-like figures, and homogeneous lipid-like zones. In smokers the inclusions are strikingly heterogeneous and measure from 0.1 to over 20 microns in diameter. Many are pleomorphic in shape. They contain the structures seen in the inclusions of nonsmokers, but lipid-like zones are more abundant. Moreover, dense angular and needlelike structures were observed only in the inclusions of smokers and may represent undigested smoke products. Various stages of phagocytosis are probably represented in lavage samples from smokers since some macrophages in these samples contain many lysosome-like inclusions while, in other macrophages, lysosomes are reduced in number and phagolysosomes predominate. (Auth. Abs.)

71-0628. Rasmussen, D. L. **Impairment of Oxygen Transfer in Dyspneic, Nonsmoking Soft Coal Miners.** *Journal of Occupational Medicine* 13(6):300-305, June 1971.

Among nonsmoking dyspneic southern Appalachian soft coal miners, impairment in oxygen transfer is almost always present. Significant abnormalities in oxygen transfer may be encountered in the presence of entirely normal ventilatory function. There is little relationship between radiographic findings of pneumoconiosis and impaired gas exchange. Such abnormalities may even be encountered in miners without definite radiographic evidence of pneumoconiosis and who have normal ventilatory capacities. Reduced oxygen transfer capacity may be an early functional abnormality. Any assessment of respiratory function of coal miners must include evaluation of gas exchange. (Auth. Abs. Mod.)

71-0629. Rylander, R. **Smoking and Pulmonary Disease (3): Studies of the Effect of Smoking in the Respiratory Organs Using Experimental Animals.** Complete English translation of "Rokning och Lungsjukdom (3): Djurexperimentella Studier av Effekter pa Andningsorganen", *Lakartidningen* 67(4):390-396, January 21, 1970.

See Abstract 70-1261.

71-0630. Simonsson, B. G. **Smoking and Pulmonary Disease (6): Acute Effects.** Complete English translation of "Rokning och Lungsjukdom (6): Akuta Effekter", *Lakartidningen* 67(4):404-405, January 21, 1970.

See Abstract 70-1263.

71-0631. Stebbings, J. H. (Jr.) **Chronic Respiratory Disease Among Nonsmokers in Hagerstown, Maryland. I. Design of the Study and Prevalence of Symptoms.** *Environmental Research* 4(2):146-162, April 1971.

The prevalence rates of the standard respiratory symptoms are presented for a population of white male nonsmokers. The observed rates for chronic bronchitis (persistent phlegm) are among the lowest rates for nonsmokers reported in the literature. The association of cough and phlegm in this population with a history of sinusitis and hayfever, and the association of dyspnea with histories of coronary disease and hypertension rather than with respiratory symptoms or illness implies that responses on the standard respiratory questionnaire, as commonly analyzed, may not, for epidemiological purposes, adequately discriminate among upper respiratory allergic conditions, lower respiratory symptoms, and cardiovascular symptoms. (Auth. Abs.)

71-0632. Stebbings, J. H. (Jr.). **Chronic Respiratory Disease Among Nonsmokers in Hagerstown, Maryland. II. Problems in the Estimation of Pulmonary Function Values in Epidemiological Surveys.** *Environmental Research* 4(2):163-192, April 1971.

Prediction equations for the $FEV_{1.0}$ and PEFR in a population of white male nonsmokers are presented. Data are also presented to demonstrate the superiority, for epidemiological purposes, of the maximum pulmonary function value in a series of trials over the mean of the sequence. Statistically significant and sizable instrument and interviewer effects were found, and a technique for taking these effects into account is presented. Analysis of published data suggested that the relationship of pulmonary function values to weight, chest expansion and diameter, and hand grip strength should be reinvestigated. Factors influencing the variability of an individual's pulmonary function values are discussed. The importance of these questions to the design and analysis of longitudinal studies of pulmonary function values is emphasized. (Auth. Abs.)

71-0633. Teculescu, D., Stanescu, D. **Pulmonary Ventilation and Distribution in Young Healthy Males, Smokers and Nonsmokers.** Complete English translation of "Ventilatia si Mixica Pulmonara la Barbati Tineri Sanatosi, Fumatori si Nefumatori", *Studdi si Cercetari de Medicina Interna* 5(11):419-423, 1970.

See Abstract 71-0101.

71-0634. Van Ganse, W. F., Ferris B. G. (Jr.), Cotes, J. E. **Cigarette Smoking and Pulmonary Diffusing Capacity.** *Chest* 59(5, Supplement):33S, May 1971.

The pulmonary diffusing capacity in 70 men and 72 women was found to decrease with increasing age and with an increase in cigarette smoking, whether expressed as lifetime or current smoking. The membrane component in both men and women decreased with age, but did not change with cigarette smoking habits. The volume of blood in the capillaries decreased with increasing age and decreased markedly with an increase in smoking, whether expressed as current or lifetime smoking.

71-0635. Van Haelst, L., Calay, R., Thys, J. P., Chailly, P. **Le Poumon Polykystique Congenital. Expose d'un Cas et Revue de la Litterature. [Congenital Polycystic Lung. A**

Case Study and a Review of the Literature.] *Acta Clinica Belgica* 22:144-156, 1967, French.

A case study of polycystic lung is reported, which was associated with an epithelioma of the kidney. A discussion of the congenital origin of this malformation and a review of the literature, pointing to the classification, the symptoms, the diagnosis, and the treatment of lung cysts are presented. The subject under study smoked from 15 to 25 cigarettes a day since adolescence. (Auth. Abs. Mod.)

71-0636. Wilhelmsen, L. **Smoking and Pulmonary Disease (5): Ventilatory Capacity and Smoking Habits of Men Born in 1913.** Complete English translation of "Rokning och Lungsjukdom (5): Ventilationsformaga och Rokvanor hos 1913 Ars Man", *Lakartidningen* 67(4):402-403, January 21, 1970.

See Abstract 70-1269.

71-0637. Wysokinski, Z. **Effects of Tobacco Smoking on Certain Parameters Reflecting the Condition of the Cardiovascular System at Rest and During Exercise (Condensation of a Doctoral Thesis).** Complete English translation of "Wplyw Palenia Tytoniu na Niektore Parametry Odzwierciedlajace Stan Ukladu Krazenia w Spoczynku i Podczas Wysilku", *Polski Tygodnik Leka* 25(25):913-916, June 22, 1970.

See Abstract 70-0915.

See also, **71-0551, 71-0571, 71-0591**

CARDIOVASCULAR DISEASES

71-0638. Agnese, G., Balestra, V. **Classification Problems in Epidemiology Studied by Multivariate Analysis.** *Giornale di Igiene e Medicina Preventiva* 11(3):115-132, July-September 1970.

A method of classifying persons by analysis of certain characteristics for which values are known is presented. This classification is considered, with specific reference to preventive medicine, whereby unknown groups of individuals can be identified and placed in some "a priori" defined groups. The data are drawn from an initial checking of the state of health of some hundreds of persons aged 50-59 (12 characteristics such as overweight, skinfold, blood pressure, blood sugar, smoking of cigarettes, drinking of coffee, Kunkel test, uric acid, serum lipids were analyzed). Another checking concerning incidence of IHD (ischaemic heart disease) was made after 3 years. The data have been elaborated by different procedures of multivariate analysis, comparing the methods used according to their ability: to allow a correct allocation into "a priori" defined groups; to elaborate numerous variates on many individuals; to indicate the best dissection into groups, under the statistical and epidemiological point of view. The conclusions are: by the means of the discriminant function, healthy/ IHD subjects, one may obtain a small probability of misclassification (6.7 percent) and a real agreement between classification and risk of disease; by the component analysis applied to the correlation matrix of the variates it seems possible to obtain further interesting indications on the tendency of individuals to divide into groups; the evaluation of distance between the individuals seems an interesting method for dissection into groups (by means of all the variates), and over all for the classification of the individuals according to the distance from the center of groups defined a priori by epidemiological considerations. (Auth. Abs. Mod.)

71-0639. Astrup, P. **Red-Cell pH and Oxygen Affinity of Hemoglobin. (Editorial)** *New England Journal of Medicine* 283(4):202-203, July 23, 1970.

Although the true nature of the oxygen-affinity controlling system cannot be settled, it can be concluded that the Hb-HbO$_2$ ratio and the binding of 2,3-diphosphoglycerate (2,3-DPG) to reduced hemoglobin is not the only mechanism, and that the time average red-cell pH is at least as important. This connection between the effects of pH on the oxygen affinity of hemoglobin and their relation to a self-regulating adjustment of the oxygen release to the tissues might explain the maintenance of plasma and red-cell pH in the living organism within extremely narrow limits. The effect of pH on 2,3-DPG leads to changed P$_{50}$ values at pH 7.40 in blood from patients with acid-base disorders, which means that the calculation of oxygen saturation and oxygen tension values in these patients, by means of the well-known log PO$_2$/pH coefficient, is invalid unless the P$_{50}$ value is also measured.

71-0640. Astrup, P. **Smoking and Coronary Disease (11): Vascular Damaging Effect of CO and Hypoxia.** Complete English translation of "Rokning och Koronarsjukdom (11): Karbeskadigende Virkning af CO og Hypoxi", *Lakartidningen* 67(3):256-261, January 14, 1970.

See Abstract 70-0768.

71-0641. Behrman, R. E., Fisher, D. E., Paton, J. **Air Pollution in Nurseries: Correlation With a Decrease in Oxygen-Carrying Capacity of Hemoglobin.** *Journal of Pediatrics* 78(6):1050-1054, June 1971.

A decrease in the hemoglobin-oxygen-carrying capacity of healthy newborn infants correlated with the level of air pollution. Pollution was estimated from daily concentrations of carbon monoxide obtained at a city pollution monitoring station; this was used as an index of the general level of air pollution. The percentage decrease in oxygen-carrying capacity was also related to the duration of postnatal exposure.

71-0642. Berenson, G. S., Srinivasan, S. R., Pargaonkar, P. S., Lindsey, S., Plavidal, F., Radhakrishnamurthy, B., Dalferes, E. R., Lopez-S., A., Dugan, F. A. **The Detection of Individuals Prone to Coronary Artery Disease—A Screening Program Conducted on Medical Students.** *Journal of the Louisiana State Medical Association* 123(2):49-56, February 1971.

Based on a combination of obesity, elevated diastolic pressure, abnormal electrocardiogram, abnormal lipids, and smoking, some 18 of 68 medical students were considered to have one or more significant risk factors. In the overall group of 12 students who admitted to smoking, 8 were observed to be obese; but only 3 of the 18 selected students were smoking. The follow-up program included a discussion of the risk factors and dietary management emphasizing the great deal of responsibility for self-care and motivation involved. The control of obesity, dietary changes, elimination of smoking, and exercise programs require considerable self-determination to change established customs and habits. Results of the study indicate that preventive measures should be stressed and that when risk factors are detected early enough, most of them can be reverted to normal without harm or inconvenience to the individual.

71-0643. Blohmke, M., Koschorreck, B., Stelzer, O. **Incidence of Risk Factors of Coronary Heart Disease in Different Age Groups and Social Classes in Men.** Complete English translation of "Haufigkeiten von Risikofaktoren der Koronaren Herzkrankheiten in Verschiedenen Altersgruppen und Sozialen Schichten bei Mannern", *Zeitschrift fur Gerontologie* 3(3):201-209, May 1970.

See Abstract 70-1096.

71-0644. Burrows, I. E., Corp, P. J., Jackson, G. C., Page, B.F.J. **The Determination of Nicotine in Human Blood by Gas-Liquid Chromatography.** *Analyst* 96(1138):81-84, January 1971.

A method has been developed for the extraction and determination of sub-microgram amounts of nicotine in blood. It involves steam distillation of the nicotine followed by solvent partition and column-chromatographic clean-up. The final solution of nicotine in ethanol is injected directly on to the column of a gas-liquid chromatograph fitted with a flame-ionization detector. The method can be used to determine down to 1 ng of nicotine, and has been applied to the measurement of nicotine levels found in the blood of smokers while smoking cigarettes. (Auth. Abs.)

71-0645. Dayton, S. **Rationale for Use of Lipid-Lowering Drugs.** *Federation Proceedings* 30(3):849-856, May-June 1971.

There is abundant epidemiologic evidence for a relationship between serum cholesterol level and incidence of coronary heart disease. The evidence that hypercholesterolemia is both necessary and sufficient for induction of atheroma in laboratory animals suggests that the relationship in human subjects is a causal one, but this requires further test. There is reason to believe that high serum cholesterol levels may be atherogenic in the face of normal serum triglyceride concentrations. Although serum triglyceride levels are indices of coronary heart disease risk in man, this effect might very well be mediated through the associated hypercholesterolemia. The relationship between cholesterol level and risk persists with advancing age at least through age 65. Clinical dietary trials aimed at primary prevention seem to confirm preventability by cholesterol lowering up to this age; smoking seems not to affect this preventability. On the other hand, both epidemiologic data and secondary prevention dietary trials suggest that moderate cholesterol lowering is relatively ineffective in prolonging life among men with overt coronary heart disease.

71-0646. Dellaportas, G., Alexander, C. S., Grannis, G. F. **Cigarettes and Heart Disease. (Letter)** *New England Journal of Medicine* 284(24):1384-1385, June 17, 1971.

These three letters-to-the-editor comment on C. C. Seltzer's recent article purporting to show a poor correlation of secular changes in cigarette consumption with heart disease mortality rates. One letter presents data which show a poor correlation between percentages of smokers of both sexes from five regions of Canada and heart disease death rates. Another letter blames this poor correlation on the slow cumulative effects of smoking which could take 20 or more years. The third letter claims that Seltzer discounted the major role of cigarette smoking in causing premature mortality among males, particularly from heart disease; that his choice of statistics confused an otherwise clear situation; and that secular changes in heart disease mortality rates have indeed paralleled changes in cigarette consumption.

71-0647. Demange, J., Auzas, A. **The Effect of Altitude on an Index of Cerebral Blood Flow in Smokers and Nonsmokers.** Complete translation of *Revue de Medecine Aeronautique et Spatiale* 8(31):125-127, 1969.

See Abstract 70-0146.

71-0648. Eilertsen, E., Sulheim, O. **Smoking and Coronary Disease (3): The Bergen Study.** Complete English translation of "Rokning och Koronarsjukdom (3): Bergenstudien", *Lakartidningen* 67(2):145-149, January 7, 1970.

See Abstract 70-1273.

71-0649. Facchini, G., Tabarroni, F., Semeraso, S., Cremonini, G. P. **Influence of Cigarette Smoke on the "In Vivo" Heparin Sensitivity Test Studied by the Thromboelastographic Method.** Complete English translation of "Influenza del Fumo di Sigaretta Sulla Prova di Sensibilita' all'Eparina "In Vivo" Studiata con Metodo Tromboelastografico", *Archivio di Medicina Interna* 20(6):1113-1118, November-December 1968.

71-0650. Giannini, S. D. **Fatores de Risco Coronariano. [Coronary Risk Factors.]** *Arquivos Brasileiros de Cardilogia* 23:345-352, October 1970. Portuguese.

A review of risk factors in coronary heart disease is presented. From an analysis of propective studies, the main risk factors are as follows: hyperlipidemias, hypertension, diabetes mellitus, obesity, smoking habits, family history, sedentary life, and electrocardiographic abnormalities. Particular emphasis is given to hyperlipidemia and hypertension because they are the most expressive conditions as predictors of coronary heart disease, particularly when they are associated with one another. (Auth. Abs. Mod.)

71-0651. Gordon, T., Kannel, W. B. **Premature Mortality From Coronary Heart Disease. The Framingham Study.** *Journal of the American Medical Association* 215(10):1617-1625, March 8, 1971.

Since 1948, a cohort of 5209 residents of Framingham, Massachusetts, have been examined biennially. In the first 14 years, 120 died of coronary heart disease (CHD) before reaching 65 years of age. Two thirds of these deaths occurred outside the hospital–the majority suddenly–within one hour of onset of the terminal event. Nearly one half of the deaths from the initial coronary attack were sudden and unexpected. One half of all persons with sudden deaths had no prior clinical heart disease. All of the men who died of CHD and were free of cardiovascular stigmas were cigarette smokers. While nonsudden coronary deaths were ordinarily preceded by clinical CHD, the disease was frequently first manifested close to the final episode. Only a small percentage of persons were seriously disabled six months before their death. Even among persons with known CHD, nearly one half of the deaths occurred outside the hospital. It is concluded that the only road to a substantial reduction in premature CHD mortality is prevention of CHD.

71-0652. Hess, H. **New Considerations on the Physiopathology of Obliterating Angiopathies. Part 2. Pathogenesis and Therapy.** Complete English translation of "Neue Uberlegungen zur Physiopathologie obliterierender Angiopathien. 2. Zur Pathogenese und Therapie", *Fortschritte der Medizin* 88(24):923-928, August 27, 1970.

A theory explaining the regulation of blood flow with a "concerted action" of changes in vascular muscle tone and blood viscosity is developed. Smoking increases blood viscosity, particularly in men with obliterating angiopathy, and reduces peripheral circulation. In the latter case, nicotine causes a direct dilation of vessels, a constriction of skin vessels via a sympathetic reflex and dilation of muscle vessels, and an initial vascular constriction by stimulating peripheral sympathetic structures. Of the many possible mechanisms affecting physiological changes in viscosity postulated in the theory, the role of plasmatic clotting and of thrombocytes is emphasized. After viewing the regulation of peripheral circulation as a cooperation of vascular wall and blood viscosity via latent coagulation and lytic processes and local reversible changes in thrombocyte properties, the theory of a uniform pathogenesis of all angiopathies leading to segmental stenoses and obliterations is derived. The occurrence of obliterating angiopathies of the most varied etiology and localization is seen in the tendency to adhesion, especially of thrombocytes, to the vascular wall. Excessive physiological reactions and pathological irritations or conditions can induce adhesions of thrombocytes and other blood elements to the vascular wall. Thus, changes in the vascular wall, endothelium or the blood can act as promoters. The further fate of such adhesions may be separation and dissolution, the development of lateral thrombi which endothelialize as plaques or complete thrombotic segmental occlusions. There are mechanisms which can prevent or break down such depositions and it is assumed that they are, in part, identical with those which reduce blood viscosity to increase local blood flow.

71-0653. Hickey, N., Bourke, G. J., Gearty, G., Mulcahy, R. **Mediscan: A Population Screening Programme for the Detection of Coronary Heart Disease Risk Factors.** *Journal of the Irish Medical Association* 64(408):155-162, March 18, 1971.

A program for detecting coronary heart disease risk factors at a population level is described along with details of the screening procedure and notes on the methodology and on the different risk factor categories. The program is fully computerized to allow the handling of large numbers of subjects. Initial feasibility studies suggest that the screening procedure is simple inexpensive enough to allow wide participation, and acceptable to both the medical profession and the public. The screening procedures consists of a brief questionnaire asking for details on smoking habits and physical activity; measurement of height, weight, biacromial diameter and skin fold thickness; electrocardiogram; blood pressure; serum cholesterol; blood sugar; and urinalysis. Risk factors of 2618 male subjects from five population groups and their placement in five risk categories ranging from low risk to overt disease groups are discussed. The number of smokers among the total screened was 48.4 percent which was strikingly lower than the 70 percent reported from a sample of Irish males ages 35-60 in 1961. This lower percentage of smokers may be due to nonsmokers being more willing to volunteer for such a screening service.

71-0654. Jones, R. A., Strickland, J. A., Stunkard, J. A., Siegel, J. **Effects on Experimental Animals of Long-Term Inhalation Exposure to Carbon Monoxide.** *Toxicology and Applied Pharmacology* 19(1):46-53, May 1971.

Rats, guinea pigs, monkeys, and dogs were exposed continuously for 90 days to 51, 96, and 200 ppm carbon monoxide. Animals were also exposed repeatedly 8 hr/day, 5 days/wk for 6 consecutive weeks to 106 ppm. No adverse toxic signs were noted during these studies. After the continuous exposures to 96 and 200 ppm, the mean hemoglobin and hematocrit values of all 4 species were elevated when compared to preexposure values. The carboxyhemoglobin (COHb) values at equilibrium were determined for the 4 species exposed continuously for 48 hr at the 3 concentrations. These COHb values correlated well with the affinity constants for the different species, and agreed closely with the theoretical calculated values. (Auth. Abs.)

71-0655. Kannel, W. B. **Current Status of the Epidemiology of Brain Infarction Association With Occlusive Arterial Disease.** *Stroke* 2(4):295-318, July-August 1971.

While the problem of differential diagnosis of the various categories of cerebrovascular disease presents a major obstacle to obtaining an undistorted picture of the epidemiological features of stroke from death certificate mortality data, the addition of evidence from prospective studies, including those in Framingham, Massachusetts, reveals that various types of arterial occlusion with cerebral infarction are by far the most prevalent type of stroke. Any specific origin of atherosclerosis remains obscure. Possible etiological candidates including dietary alterations in salt, fat and refined carbohydrates, sedentary living, excessive calories promoting obesity, the cigarette habit and even the mineral content of water in addition to marital status have all been incriminated. However uncertain the final answer is, certain precursors for atherosclerosis, such as hypertension, diabetes, and hyperlipidemia, are important. Of these, hypertension is clearly the most important contributor to stroke incidence. Certain combinations of items carry more risk than do the same items singly. For example, the risk of a brain infarction in diabetics with hypertension is probably about six times that of normal subjects. In persons under 50 at the time of measurement, risk of cerebral infarction is possibly ten times higher in those with hypertension and elevated lipids than in those without either elevated. This compounding of risk has pathogenetic, preventive and public health implications. For purposes of stroke screening alone the most efficient and practical method would be to determine casual blood pressure, although it must be stated that as yet there is uncertainty concerning the change in the risk if such blood pressure is treated. (Auth. Abs. Mod.)

71-0656. Krosch, H. **Zur Prophylaxe des Herzinfarkts. [Prophylaxis of Myocardial Infarct.]** *Wissenschaftliche Zeitschrift der Martin-Luther Universitat Halle-Wittenberg, Mathematisch-Naturwissenschaftliche Reihe* 19(1):19-23, 1970, German.

The more important factors involved in the development of myocardial infarct are discussed briefly. The findings of the Framingham Study and of anti-coronary clubs are compared. An anti-coronary diet of 2000-2700 calories and 30-33 percent saturated and unsaturated fat in equal measure helps reduce overweight and favorably influences diabetic metabolic disorders, hypertension and hyperuricemia. Nicotine does not seem to increase the likelihood of coronary sclerosis but appears to further blood coagulation, and in younger individuals, acute coronary occlusion mechanisms. An elevated viscosity of blood and plasma has also been observed. Studies at the Medical University Clinic at Halle on several risk factors for myocardial infarct (age, cholesterol level, and smoking) gave results not quite in accord with those of other authors. The role of psychic stress in myocardial infarct is debatable. Soviet studies seeking to prove that physical activity (sports or hard physical labor) are useful preventive measures are also disputed.

71-0657. Lundman, T. **Smoking and Coronary Disease (6): Coronary Disease in Smoking-Discordant Twins.** Complete English translation of "Rokning och Koronarsjukdom (6): Koronarsjukdom hos Rokningsdiskordanta Tvillingar", *Lakartidningen* 67(2):156-160, January 7, 1970.

See Abstract 70-1289.

71-0658. Meijler, F. L. **Arts en Roken. [Doctors and Smoking.]** *Nederlands Tijdschrift voor Geneeskunde* 115(12):511-513, March 20, 1971, Dutch.

The report discusses in general fashion the influence of smoking on cardiovascular morbidity and mortality in the Netherlands. Several reports referring to the morbidity and mortality statistics attributable to smoking in Great Britain and the United States are cited. Based on such statistics it is estimated that of approximately 15,000 men who die annually of myocardial infarct in the Netherlands, 2000 are between 45-54 years and of these 750 deaths can be attributed to the smoking habit. The morbidity is not as easily quantified but smoking evidently promotes the morbidity and invalidism of 1500 men in this age group. The number of men in this bracket who suffer coronary damage with no evident myocardial infarct is believed to be many times higher. The obligations of Netherland's physicians and health workers to set a personal example by refraining from smoking, to induce young people not to start, to demonstrate the harmfulness of smoking, and to take active participation in anti-smoking measures is stressed. Several recommended steps to protect the cardiovascular health of the people are mentioned.

71-0659. Paffenbarger, R. S. (Jr.), Gima, A. S., Laughlin M. E., Black, R. A. **Characteristics of Longshoremen Related to Fatal Coronary Heart Disease and Stroke.** *American Journal of Public Health* 61(7):1362-1370, July 1971.

San Francisco longshoremen who underwent multiphasic screening in 1951 were studied for factors that predisposed to fatal coronary heart disease and stroke in an 18-year follow-up. Men with physically less active jobs, who expended 925 fewer calories per work day, sustained coronary death rates one-quarter higher than cargo handlers. Differences in coronary mortality were largest at younger ages and decreased steadily to disappearance at older ages. Splitting the population into presumed high- and low-risk groups sorted out four other characteristics associated with coronary mortality: pre-existing heart disease, systolic blood pressure above mean levels, cigarette smoking of one or more packs per day, and weight-for-height above mean levels. The risk of coronary mortality accompanying each of these characteristics was greater for individuals who were less active than for cargo handlers. Longshoremen with more sedentary jobs sustained stroke death rates similar to those of cargo handlers. Three other characteristics, however, identified groups at high-risk of stroke mortality; pre-existing heart disease, systolic blood pressure above mean levels, and abnormal glucose metabolism. The association between work activity and coronary mortality, when considered with the lack of such association with stroke mortality, suggests that physical activity influences the myocardium or its function more than the atherosclerotic process.

71-0660. Paras Chavero, E., Mercado Contreras, E., Quintero Novella, A. **Tobaccoism and Coronary Cardiopathy. Long-Term Effects in the Patient Who Has Suffered a Myocardial Infarct.** Complete English translation of "Tabaquismo y Cardiopatia Coronaria. Su Accion en la Evolucion a Largo Plazo en el Paciente que Ha Padecido un Infarto del Miocardio", *Archivos del Instituto de Cardiologia de Mexico* 15(2):128-134, March-April, 1970.

See Abstract 70-0904.

71-0661. Paul, O. **Risks of Mild Hypertension: A Ten-Year Report.** *British Heart Journal* 33(Supplement):116-121, 1971.

Data relating to the risks of hypertension are presented from six prospective studies of cardiovascular disease initiated in the United States during the period 1948-1958. A total of 6640 men, aged 30 to 59 at entry, were followed for 10 years and observations were recorded for mortality from all causes with particular attention on morbity and mortality from cardiovascular diseases. Diastolic blood pressures of 85 to 104 mm Hg as recorded on the initial visit have unfavorable implications in terms of total death rate, deaths from coronary disease, major coronary events (non-fatal myocardial infarctions and deaths from coronary disease), and cerebrovascular episodes. The deleterious effect is most conspicuous for men in their fifties, but also appears in the younger age groups. The presence of high serum cholesterol concentration and the use of cigarettes increases the risk of nonfatal myocardial infarctions and coronary deaths at essentially all blood pressure levels.

71-0662. Petrovic, D. **Uvecanje Broja Eritrocita i Kolicine Hemoglobina u Krvi Pusaca. [Increase in the Number of Erythrocytes and in the Amount of Hemoglobin in the Blood of Smokers.]** *Medicinski Glasnik* 24(10/11):470-473, October-November 1970, Serbo-Croatian.

The carboxyhemoglobin (COHb), erythrocytes and hemoglobin were determined in the blood of 343 men. Among them were 230 smokers and 113 nonsmokers. The COHb levels, the number of erythrocytes and the quantity of hemoglobin were found to be significantly larger in the blood of smokers than in the blood of nonsmokers. This appeared to be the result of the compensatory formation of erythrocytes and hemoglobin in order to replace elements which were bound with carbon monoxide. Significant differences were observed in persons who smoked up to 15 cigarettes per day and in individuals who smoked more than 25 cigarettes per day. The amount of cigarettes smoked before blood samples were taken in the morning also caused significant differences in COHb levels. Contrary to this, no significant differences were found in relation to the kind of cigarettes they smoked or the duration of their smoking habit.

71-0663. Rosenman, R. H. **Assessing the Risk Associated with Behavior Patterns.** *Journal of the Medical Association of Georgia* 60:31-34, February 1971.

Results from this study indicate that the behavior pattern of an individual is significantly and in part independently related to his prospective coronary status. Accordingly, clinical assessment of an individual's behavior pattern not only helps to define coronary-proneness per se but significantly enhances the predictive specificity of other more widely used risk factors, such as high serum cholesterol and triglyceride levels, high diastolic blood pressure, and heavy smoking habit. Two references are cited which confirm the value of assessing the behavior pattern in the total assessment of an individual's candidacy for future clinical coronary heart disease.

71-0664. Sartwell, P. E., Masi, A. T., Arthes, F. G., Greene, G. R., Smith, H. E. **Thromboembolism and Oral Contraceptives: An Epidemiologic Case-Control Study.** *American Journal of Epidemiology* 90(5):365-380, November, 1969.

A retrospective study of thromboembolism in females of reproductive age was conducted in five American cities. Cases were 175 women aged 15-44, discharged from 43 hospitals after initial attacks of idiopathic thrombophlebitis, pulmonary embolism, or cerebral thrombosis or embolism. Idiopathic cases constituted only a small fraction of total thromboembolism patients. The 175 hospital controls were matched pairwise with the cases on hospital, residence, time of hospitalization, race, age, marital status, parity and pay status. Both groups were free of chronic conditions either associated with thromboembolism or constituting contraindications to pregnancy, and were presumably fertile. They were interviewed to provide information on their use of oral contraceptives before hospitalization. Sixty-seven cases and 23 controls had used these products until within one month before they were hospitalized; 11 cases and controls had discontinued use earlier. Duration of use did not affect the risk. There were 57 case-control pairs in which only the case had used an oral contraceptive within one month compared to 13 in which only the control had done so. The relative risk of thromboembolism for the users is estimated to be 4.4 times that of nonusers. The risk was higher for users of sequential products. It is estimated that 25 percent of the cases in this series were attributable to oral contraceptives. Data indicate an association of at least borderline significance between heavy smoking and thromboembolism. (Auth. Abs. Mod.)

71-0665. Semaine des Hopitaux (Informations) **Le Bilan de l'Infarctus du Myocarde. [Evaluation of Myocardial Infarct.]** *Semaine des Hopitaux (Informations).* No. 2:5-7,10,12,14,15,17,20-23, March 14, 1971, French.

A review of the events and discussions which took place during the European Heart Week in which myocardial infarct was evaluated is presented. The week was a prelude to World Heart Day to be sponsored by the World Health Organization in April 1972. Myocardial infarct is said to have reached epidemic proportions. In France, 41 percent of all deaths can be attributed to cardiovascular disease which is twice as many as deaths due to cancer, tuberculosis, and polio combined. The risk factors involved are discussed, primarily pointing out the danger of smoking. In a study in Provence, France, 43 percent of those suffering from arteriopathy were heavy smokers while in a control population without arterial disease, only 13 percent were smokers. Medical costs related to cardiovascular disease, the need for treatment immediately after an infarct, surgical possibilities, artificial hearts, preventive measures, and the readaptive procedure after suffering an infarct are discussed.

71-0666. Sive, P. H., Medalie, J. H., Kahn, H. A., Neufeld, H. N., Riss, E. **Distribution and Multiple Regression Analysis of Blood Pressure in 10,000 Israeli Men.** *American Journal of Epidemiology* 93(5):317-327, May 1971.

Blood pressure distribution of 10,000 male Israeli government and municipal employees aged 40 and over examined in 1963 in the Israel Ischemic Heart Disease Project show curves which rise with age, more steeply for systolic pressure than for diastolic pressure closely resembling those of various populations in the United States and Europe. Despite marked differences in ways of life among the regional birth groups, there is a remarkable similarity in their blood pressure distributions. Multiple regression analysis relating systolic pressure to 18 biological and environmental variables showed that 14 of these were together significantly responsible for 21.6 percent of systolic pressure variance in the total population. The variables age and pulse rate, and to a lesser extent, myocardial ischemia on ECG and a weight-height ratio accounted for significant percentages of variance in all areas of birth. The remaining variables in order of their relative importance were: serum uric acid, cigarette smoking, serum cholesterol, hematocrit, diabetes mellitus, history of peptic ulcer, history of renal disease, anxiety index, financial, work and family troubles, and angina pectoris. Among the regional birth groups, the percentage variance in systolic pressure explained by the variables studied ranged from 16.6 percent to 29.0 percent. This fact and the differing relative importance of a number of variables within these groups indicate the need for further studies including other environmental as well as hereditary factors in multivariate analysis of blood pressure in polyethnic population groups.

71-0667. Stamler, J. **Acute Myocardial Infarction–Progress in Primary Prevention.** *British Heart Journal* 33(Supplement):145-164, 1971.

Socioeconomic and sociocultural evolution in the twentieth century has led to a way of life for tens and hundreds of millions in advanced countries that is conducive to widespread premature coronary disease. Repeated reference is made to coronary risk factors and their frequent occurrence in the population of the developed nations. These factors include rich diet and diet-dependent hyperlipidemia, obesity, hyperglycemia, hypertension, hyperuricemia, cigarette smoking, impaired vital capacity, sedentary and stressful living, hypothyroidism, renal disease and positive family history of premature vascular disease. Three cardinal risk factors which stand out in view of their frequency of occurrence, their impact on risk, and their preventibility and reversibility are hypercholesterolemia, hypertension and cigarette smoking, particularly when present in combination. A review of findings from the New York Anti-Coronary Club Study, the Finnish Mental Hospital Study, the Los Angeles Veterans Administration Domiciliary Center Study, and the Chicago Coronary Prevention Evaluation Program, all first generation studies on primary prevention of coronary heart disease, indicated that change in living habits, particularly diet, and in the Chicago study cigarette smoking, is associated with decreased incidence or mortality, or both, from myocardial infarction and coronary heart disease. Although these studies were imperfect in design, methodology, or results, and were handicapped by such problems as relatively small numbers and improper randomly assigned control groups, their findings were similar and in agreement with expectation in terms of findings from clinical, pathological, animal-experimental, and descriptive epidemiological research.

71-0668. Szollosi, E., Medve, F., Jeney, E. **Angaben zur Wirkung des niedrigen Kohlenmonoxyd-Gehaltes in der Luft auf den Menschen. [Data on the Effect of Low Carbon Monoxide Content of the Air on People.]** *Zentralblatt fur Arbeitsmedizin und Arbeitsschutz* 20(9):263-268, September 1970, German.

Investigations of 142 bus drivers (I), 92 bus conductors (II) and 245 truck drivers (III) exposed to carbon monoxide (CO) concentrations varying from 30 to 60 mg/m^3 in the vehicle interiors were carried out in 1966 and 1967. The tests covered general health complaints, blood pressure, carboxyhemoglobin (CO-Hb) content, red blood cell count, hemoglobin content of the red blood cells, and the quality of the blood picture. It was observed that groups I and III, neither of which contained female employees, had higher CO-Hb levels after work than at the end of the day off, and the levels were higher in smokers than in nonsmokers. In group II, the CO-Hb levels were also higher in smokers than nonsmokers but the averages were higher after the day off than after work. This is explained by the high percentage of women (46 percent) in this group who are exposed to high CO concentrations in their gas range-equipped kitchens. It was also observed that operators of vehicles smoke rather heavily and the additional CO concentrations in the vehicles can cause accidents due to the lowered hemoglobin content.

71-0669. Tibblin, G., Wilhelmsen, L. **Smoking as a Risk Factor.** Complete English translation of "Rokningen som Riskfaktor", *Lakartidningen* 68(7):687-689, February 10, 1971.

This article reports on the first longitudinal study in Sweden concerning the relationship of smoking with various diseases and death. Results indicate that among men, ages 50-57, heavy smokers have 10 times greater risk of having myocardial infarct and 5 times greater risk of dying than nonsmokers. With results from other foreign studies and in particular the "Men Born in 1913" study as arguments, the physician corp is urged to take active measures against smoking.

71-0670. Tibblin, G. **Smoking and Coronary Disease (2): General Survey.** Complete English translation of "Rokning och Koronarsjukdom (2): Allman Oversikt", *Lakartidningen* 67(2):140-144, January 7, 1970.

See Abstract 70-1293.

71-0671. Waxler, E. B., Kimbiris, D., Dreifus, L. S. **The Fate of Women with Normal Coronary Arteriograms and Chest Pain Resembling Angina Pectoris.** *American Journal of Cardiology* 281(1):25-32, July, 1971.

The clinical and laboratory findings and subsequent fate of 100 women with unexplained chest pain, having some or all of the features of angina pectoris, and normal selective coronary arteriographic findings were studied. Some basis for the chest pain was discovered in only 14 percent (14 of 100) and included the unusual conditions of systolic click syndrome, primary myocardial disease, rheumatic heart disease and a cystic duct neuroma. Of the remaining 86 patients with no readily apparent cause for their symptoms, the average age was 44 years. Atypical angina was noted in 76 percent (65 of 86); 46 percent (40 of 86) gained relief of pain from nitroglycerin, and 40 percent (34 of 86) manifested anxiety neurosis. Of 44 patients who exercised, 16 had a positive electrocardiographic response of S–T segment depression of more than 1 mm, yet this group did not differ significantly from those with a negative response to exercise. The smoking habits of 80 patients were also analyzed. Follow-up study of these 86 patients from 6 months to 2½ years revealed that 50 percent had a decrease or disappearance of pain. More important, there was no instance of sudden death or myocardial infarction. It is suggested that chest pain with normal coronary arteriographic findings should be clearly distinguished, especially as to its benign prognosis, from the angina pectoris associated with large vessel obstructive atherosclerosis and that it most likely is related to neurocirculatory asthenia, although other possible explanations are discussed.

71-0672. Werko, L. **Can We Prevent Heart Disease?** *Annals of Internal Medicine* 74(2):278-288, February 1971.

Prevention of heart disease is critically reviewed. Although several risk factors have been identified that seem to characterize individuals most prone to later development of ischemic heart disease, no one has been able to show that interfering with these risk factors will decrease the incidence of the disease. In the continuing population study in Goteborg, Sweden, of males born in 1913 and the incidence of myocardial infarction among them in relation to such risk factors as blood lipids, smoking, sedentary habits, and high blood pressure, the incidence of myocardial infarction in those exhibiting only one or two risk factors has been low. When three factors occurred in the same individual, the incidence increased. Those who were smokers, had sedentary jobs, and had both elevated cholesterol and triglycerides had an incidence above 10 percent. The incidence was around 20 percent if all new coronary events were counted. The removal of only one risk factor may have little or no impact on overall morbidity or mortality. A multifactorial approach seems necessary to influence a disease that, like ischemic heart disease, is affected by many environmental factors. The hypothesis that removal of several risk factors will decrease the incidence of ischemic heart disease must be tested before any large-scale changes are advocated in our life style; such a study is described. Changing social structure in the community, however, may be of larger importance for the prevention of ischemic heart disease than any medical intervention.

71-0673. Zdichynec, B. **Zmeny v Bilem Krevnim Obraze u Dlouhodobych Kuraku. (Na Zaklade Srovnani Souboru Nemocnych s Transmuralnim Srdecnim Infarktem a Nemocnych bez Priznaku Koronarni Choroby v Predchorobi). [The Change in White Blood Cell Count in Long-Time Smokers. (Basis for the Comparison of Patients With Transmural Myocardial Infarct and Patients Without Symptoms of Coronary Disease).]** *Vnitrni Lekarstvi* 17(4):327-330, April 1971, Czech.

In 159 patients with transmural myocardial infarction it was found that smokers in comparison with nonsmokers, had a statistically significant higher rate of eosinophilia and lymphocytosis. In a control group of long-term smokers without a history of acute myocardial infarction, blood changes were very similar to those in smokers with myocardial infarction. These results could be due to an allergic reaction to smoking.

See also, **71-0571, 71-0575, 71-0597, 71-0617**

OTHER DISEASES AND CONDITIONS

71-0674. Fedrick, J. Alberman, E. D., Goldstein, H. **Possible Teratogenic Effect of Cigarette Smoking.** *Nature* 231(5304):529-539, June 25, 1971.

In a study to determine the relation of smoking during pregnancy to the incidence of congenital heart disease, questionnaires were completed for 98 percent of all births during the first week of March 1958 and for stillbirths and neonatal deaths during March, April and May 1958 in England, Scotland and Wales. These amounted to 68 and 204, respectively, excluding multiple births and those in whom the defect was associated with anencephalus, spinal bifida or Down's syndrome. Results showed that in both groups there was a significant increase in the proportion of mothers who smoked compared with the mothers of singletons in the control week who did not have infants with congenital heart disease. The incidence of cogenital heart disease in singleton babies of mothers who smoked was 7.3 per 1000 births, compared with 4.7 per 1000 of babies of nonsmokers. An analysis of variance showed that the smoking effect was independent of maternal age, parity and social class, and was highly significant. Although the small number of cases made it difficult to relate specific types of congenital heart disease with maternal smoking, there seemed to be an association with patent ductus arteriosus and Fallot's tetralogy.

71-0675. Battig, K., Hrubes, V. **The Effect of Filtrate Fractions of Tobacco Smoke on Swimming Endurance in the Rat.** *Zeitschrift fur Praventivmedizin* 16(2):205-210, March-April 1971.

Twenty minutes after the termination of exposure to filtered and unfiltered smoke, the swimming endurance of 21 rats was measured. In experiment I (with only short pretraining of the rats) 10 and 20 puffs resulted in minor reductions of the swimming endurance, which did not surpass the threshold of significance. In the second experiment with the same rats (20 puffs only), the exposure sessions resulted in the following reductions of swimming endurance as compared to the control: Cambridge-filtered smoke, 11 percent (not significant); Cambridge-charcoal-filtered smoke, 18 percent (marginally significant); charcoal-filtered smoke, 29 percent ($p < 0.01$) and full smoke, 32 percent ($p < 0.01$). The differences between Cambridge-filtered smoke on one hand and charcoal-filtered and full smoke on the other hand also exceeded the threshold of significance. (Auth. Abs.)

71-0676. Cohen, B., Poswillo, D. E., Woods, D. A. **The Effects of Exposure to Chewing Tobacco on the Oral Mucosa of Monkey and Man. A Histological and Ultrastructural Study.** *Annals of the Royal College of Surgeons of England* 48(5):255-273, May 1971.

Premalignant lesions occurring in the mouths of habitual chewers of tobacco-containing compounds in India were studied by light and electron microscopy. Prolonged exposure to these compounds was effected experimentally by sealing the material used by betel-chewers into the cheek pouches of monkeys. At both microscopic and submicroscopic levels close similarities were identified. The most conspicuous, which was also the earliest change seen experimentally, was a ballooning of cells; this feature, previously attributed to intracellular edema, was shown by electron microscopy to reflect the development of vacuoles within the cytoplasm. In both human and monkey mucosa a phenomenon conceivably indicative of invasion at its inception was identified; it comprised a disruption of the epithelio-connective tissue interface through which extrusions of epithelial cells herniated into the underlying corium. (Auth. Abs. Mod.)

71-0677. Crews, S. J., James, B., Marsters, J. B., West, R. H. **Drug and Nutritional Factors in Optic Neuropathy.** *Transactions of the Opthalmological Societies of the United Kingdom* 90:773-794, 1970.

While many drugs are reported to have caused toxic amblyopia, the number of cases for each drug is small. However, few surveys using sensitive tests have been conducted to assess sub-clinical degrees of toxicity. The low incidence would suggest indirect mechanisms of a nutritional or vascular nature, genetic enzyme defects or hypersensitivity. Identification and correction of such predisposing factors should allow essential drug therapy to be continued. Accordingly a number of patients with optic neuropathies were investigated for these factors. These patients fitted into three main diagnostic groups—low-tension glaucoma, nutritional amblyopia and Leber's optic atrophy, though there was some degree of overlap. Drugs could only be considered an etiological factor in a small number of cases; these drugs were, however, of a type in which multiple modes of action have been implicated both as regards tobacco and other aspects of nutrition. In 3 out of 4 cases there was a response to vitamin B_{12} therapy or cessation of smoking. Three of the patients were using drugs which might induce systemic hypotension. Tobacco and other nutritional factors were found in half the low-tension glaucoma group; as yet, it is too early to assess their significance or the result of hydroxycobalamin therapy. The Farnsworth 100 Hue Test was found of value in differentiating between the diagnostic groups. The visual field analyser (V.F.A.) showed areas of central depression in a proportion of the nutritional type of low tension glaucoma, and in many of the treated nutritional amblyopes which could not be detected by Goldmann or Bjerrum apparatus. Greater value is now attached to the V.F.A. results since a survey was conducted on normal patients which identified the normal levels of response for one particular machine. Practical problems were exposed relating in part to the design of the apparatus, many of which are overcome by the new front. (Auth. Abs.)

71-0678. Currie, A. R., Bird, C. C., Crawford, A. M., Sims, P. **Embryopathic Effects of 7,12-Dimethylbenz(*a*)-anthracene and Its Hydroxymethyl Derivatives in the Sprague-Dawley Rat.** *Nature* 226(5249):911-914, June 6, 1970.

7,12-Dimethylbenz(*a*)anthracene and one of its hydroxymethyl derivatives have been shown to cause a variety of fetal abnormalities, especially when administered on day 13 of pregnancy. It is suggested that derivatives of benz(*a*)anthracene must have active side chains situated at C-7 and C-12 for embryopathic activity. (Auth. Abs.)

71-0679. Fisher, K. D., Carr, C. J., Huff, J. E., Huber, T. E. **Dark Adaptation and Night Vision.** *Federation Proceedings* 29(5):1605-1638, September-October 1970.

This study was undertaken to provide a comprehensive review of the state of knowledge on vision as related to dark adaptation and night vision in man. In the preliminary reviews of this subject, the interrelationships of the physiological, biological, behavioral, and physical factors that affect vision were considered. However, in this study, emphasis has been restricted to the current biochemical and biophysical concepts of dark adaptation and night vision, the role of nutrition as it affects dark adaptation, and the pharmacologically induced alterations of night vision. In addition, the effects of smoking and noxious environmental agents are considered as well as the poorly understood individual variability in night vision capacity. (Auth. Abs.)

71-0680. Forster, W. **Anamnestische Erhebung uber Ulcera ventriculi et duodeni. [Anamnestic Investigation of Gastric and Duodenal Ulcers.]** *Schweizerische Rundschau fur Medizin* 59(48):1675-1681, December 1, 1970, German.

Anamnestic data obtained by personal interrogation of 64 persons suffering from ulcers (39 duodenal, 25 gastric) were examined. There were no visible differences between ulcer patients and controls regarding diet and alcohol and tobacco consumption. Visible differences appeared, however, when viewing psychosocial disturbances of patients and controls. The duodenal ulcer patients, and to a lesser extent the gastric ulcer patients, were most clearly afflicted. The results indicate that factors linked with personality (poor assimilation of psychosocial problems) have a more important role than exogenous factors (alimentation, alcohol, tobacco) in the development of ulcers.

71-0681. Hamner, J. E., Mehta, F. S., Pindborg, J. J., Daftary, D. K. **An Epidemiologic and Histopathologic Study of Leukoedema Among 50,915 Rural Indian Villagers.** *Oral Surgery, Oral Medicine and Oral Pathology* 32(1):58-65, July 1971.

Fifty-eight cases (0.11 percent) of leukoedema were discovered in a house-to-house survey of 50,915 rural villagers from four Indian states. The prevalence ranged from 0.02 percent (four cases) in Bihar to 0.25 percent (twenty-six cases) in Kerala. Fifty-two of the fifty-eight leukoedemic persons were men; the remaining six were fisherwomen who practiced reverse smoking in Andhra Pradesh. All of those who exhibited leukoedema also practiced some form of smoking habit; bidi smoking was the most popular. There was no evidence of epithelial atypia or malignant change in any of the twenty buccal mucosal biopsies. The characteristic histologic feature of leukoedema was the accumulation of spongy/vacuolated cells in the superficial epithelial layer. In thirteen of the twenty specimens these cells were present also deeper within the stratum spinosum. (Auth. Abs.)

71-0682. Kessler, I. I., Diamond, E. L. **Epidemiologic Studies of Parkinson's Disease. I. Smoking and Parkinson's Disease: A Survey and Explanatory Hypothesis.** *American Journal of Epidemiology* 94(1):16-25, July 1971.

Nicotine has long been known to affect the central and peripheral nervous systems of man. It has variously been regarded as an exacerbating factor or as a therapeutic modality in Parkinson's disease. Three prospective studies have demonstrated a lower risk of death from Parkinson's disease among smokers than nonsmokers. A previous retrospective study confirmed that patients with this condition are less likely to smoke tobacco than other patients, but attributed this to an artifact resulting in the selection of control patients with excessive smoking habits. In the present investigation, the smoking histories of all Baltimore residents discharged with a diagnosis of Parkinson's disease from the hospitals of Baltimore over a 2-year period were ascertained. These patients were less likely to have ever smoked and, if smokers, tended to smoke less than a comparable group of patients without Parkinson's disease. Tremors, rigidity, hypokinesia and alterations in facies and speech were somewhat less prevalent among male parkinsonians who smoked than among those who did not. Relatively few female patients smoked and these did not differ substantially in their neuropathologic symptoms from the nonsmokers. Smokers tended to develop neurologic deficits at an earlier age than nonsmokers, thus suggesting the possibility of two forms of Parkinson's disease – one more refractory than the other to the effects of nicotine. An hypothesis involving known metabolic pathways of the biogenic amines is suggested for further study of the observed relationships between smoking and Parkinson's disease. (Auth. Abs.)

71-0683. Konturek, S. J., Solomon, T. E., McCreight, W. G., Johnson, L. R., Jacobson, E. D. **Effects of Nicotine on Gastrointestinal Secretions.** *Gastroenterology* 60(6):1098-1105, June 1971.

The effect of nicotine on gastric, pancreatic, and hepatic exocrine secretions was assessed in conscious dogs prepared with various combinations of Heidenhain pouch, gastric, pancreatic, and biliary fistulas. The alkaloid was infused in doses corresponding to amounts absorbed from smoking up to four cigarettes in 1 hr. In the pancreas nicotine inhibited the secretin-stimulated secretion of both fluid and bicarbonate, and the degree of inhibition was dose-related. Spontaneous biliary secretion of bicarbonate was also depressed by the drug. Nicotine did not alter gastric secretion of acid, gastric mucosal blood flow, or the mucosal barrier to hydrogen or sodium ions. These findings provide a possible link between cigarette smoking and duodenal ulcer formation. Specifically, the nicotine from cigarette smoke may inhibit pancreatic and hepatic bicarbonate secretion in man, thereby depriving the duodenum of the alkaline secretion it needs to neutralize gastric acid adequately. (Auth. Abs.)

71-0684. Kuenssberg, E. V. **Therapeutische Prufungen in der Allgemeinpraxis. [Therapeutic Tests in General Practice.]** *Therapiewoche* 20(34):1674-1683, August 26, 1970, German.

Several fundamental principles for the therapeutic–clinical testing of drugs by general practitioners and some reasons for possible failure of the tests are discussed. A large-scale investigation by the Royal College of General Practitioners (Great Britain) concerning the effects of anti-conception pills is presented as a valid example of testing procedures. The majority of the pill-taking women were in the smoker group.

71-0685. Kueppers, F. **Alpha$_1$-Antitrypsin: Physiology, Genetics and Pathology.** *Humangenetik* 11:177-189, 1971.

In human serum, alpha$_1$-antitrypsin (α_1-at) is a glycoprotein that inhibits the enzymatic activity of trypsin and other proteolytic enzymes. Its concentration in normal serum is 200–250 mg/100 ml. In certain physiological and pathological situations, such as pregnancy, under contraceptive medication and during inflammation, the level of α_1-at is elevated. The physiological role of α_1-at is not known, but the interaction with proteolytic enzymes from white blood cells is probably important. Electrophoretic techniques distinguish several phenotypes, which can be explained by the existence of several codominant alleles at one locus (probably the structural locus). Two alleles Pi^Z and Pi^S cause low concentrations of α_1-at in serum: the approximate concentrations of α_1-at for the different phenotypes are Z/Z 10 percent, M/Z 50–60 percent, S/S 60 percent, M/S 80 percent, where the level of 212 mg/100 ml found in the M/M phenotype is taken at 100 percent; thus the effect of these alleles on the α_1-at concentration is additive. Homozygosity for the Pi^Z allele is strongly associated with chronic obstructive lung disease and there is also an association of chronic obstructive pulmonary disease and heterozygosity for the Pi^Z or Pi^S or both, but to a lesser degree. (Auth. Abs.)

71-0686. Kullander, S., Kallen, B. **A Prospective Study of Smoking and Pregnancy.** *Acta Obstetricia et Gynecologica Scandinavica* 50(1):83-94, 1971.

A prospective study was performed on the effect of smoking on pregnancy, using information from 6363 pregnancies with known smoking habits. Of these, 2806 (44 percent) smoked during pregnancy, and 2731 (97 percent) of the 2806 reported that they smoked during the whole pregnancy. The well-known effect on prematurity rate and mean birth weight was verified in this study. A 50 percent increase of prematurity rate was registered among smoking women compared with nonsmoking women. The mean birth weight reduction was 170 g among live-born, non-malformed children. These effects were found to occur irrespective of other variables studied: maternal age, parity, and whether the pregnancy was wanted. The body length, head circumference, and shoulder circumference were found to be reduced in children born to smoking women. Placental weight was also reduced, but the ratio placental weight over body weight increased with smoking. No effect on the malformation rate was observed, but the series is too small to exclude a teratogenic effect of smoking. Children were followed to 1 year of age. The death risk for a child of a smoking woman was found to be increased to 1.6 times that for a child of a nonsmoking woman. No significant difference in stillbirth rate was found, but an effect was found on neo-natal death both before and after the age of 1 week, although ony among non-premature children. Among children dying before the age of 1 week, a significant increase in frequency of abruptio placentae was noted. No other specific cause of death was noted. An overall increased risk of spontaneous abortion among smoking women was verified; this was shown to be almost completely due to the association between the fact that the pregnancy was unwanted and smoking. An even higher incidence of smoking was seen among women with induced abortions. Spontaneous abortion is also associated with unwanted pregnancies, perhaps due to the presence of induced abortions among the group recorded as spontaneous abortions. Smoking was shown to be associated only with late spontaneous abortions. If there is an abortifacient effect of smoking, it must be very slight. The decreased rate of preeclamptic complications among smoking women, described by earlier authors, was verified. A similar decrease in frequency of morning sickness was also found. No effect of smoking on the mean Apgar score of surviving, non-malformed children was seen. The sex ratio among children born to smoking women differed slightly from that born to nonsmoking women, but this difference was not statistically significant. (Auth. Abs.)

71-0687. Martin, J. C., Becker, R. F. **The Effects of Maternal Nicotine Absorption or Hypoxic Episodes Upon Appetitive Behavior of Rat Offspring.** *Developmental Psychobiology* 4(2):133-147, 1971.

Offspring of rats which had received either daily nicotine injections or hypoxic episodes throughout gestation were tested at adulthood on various appetitive schedules in a double-bar Foringer chamber. The hypoxic offspring and the offspring whose mothers had received nicotine throughout gestation and the nursing period performed more poorly on fixed-ratio, variable interval discrimination, and discrimination reversal schedules. Possible explanatory hypotheses are discussed. (Auth. Abs.)

71-0688. Palmgren, B., Wallander, B. **Cigarette Smoking and Abortion. Consecutive Prospective Study of 4312 Pregnancies.** Complete English translation of "Cigarettrokning och Abort. Konsekutiv Prospektiv Undersokning av 4312 graviditeter", *Lakartidningen* 68(22):2611-2616, May 26, 1971.

As part of a prospective perinatal study at a hospital in Helsingborg, the abortion material was analyzed with relationship to the mother's smoking habits. Of the 4312 pregnancies studied, 385 (8.9 percent) ended in abortion. In nonsmokers, who comprised about half of the subjects, the frequency of abortion was 7.8 percent, as compared with 9.1 percent in moderate smokers and 14.5 percent in heavy smokers. Among the abortions, early abortion predominated (90 percent), and this was independent of the women's smoking habits. In heavy smokers (more than 10 cigarettes/day), frequency of abortion in the second month of pregnancy was twice as high as in moderate smokers and nonsmokers. Upon macroscopic examination of the aborted material, heavy smokers had an increased frequency of abortion with whole amnionic sac containing a fetus of normal size, and an increased frequency of missed abortions In hereditary anamnesis, there were more anomalies among the smokers, whereas allergy and primarily diabetes occurred more often among the nonsmokers. Previous abortion and previously born lowweight infants occurred more often among heavy smokers. Among heavy smokers, there was a higher incidence of individuals who were unmarried at the time of conception, and wage earning was more prevalent. There was also a higher consumption of sedatives and analgesics among heavy smokers. It is concluded that a woman who wants to be pregnant and who is anxious to complete her pregnancy should be counselled to give up cigarette smoking.

71-0689. Phillips, C. I., Wang, M. K., Van Peborgh, P. F. **Some Observations on the Mechanism of Tobacco Amblyopia and Its Treatment With Sodium Thiosulphate.** *Transactions of the Ophthalmological Societies of the United Kingdom* 90:809-826, 1970.

A study of four patients shows the difficulties in assessment of the results of treatment in tobacco amblyopia, partly because criteria are subjective, both on the part of the patient and on the part of the examiner, and also because so many factors other than tobacco, e.g. diet, play a part. However, the results provide some evidence that sodium thiosulfate has improved vision in three of the four patients with tobacco amblyopia who continued smoking and drinking as before. This contributes to the evidence that cyanide poisoning is fundamentally the cause of tobacco amblyopia. Unfortunately, sodium thiosulfate has to be given intravenously so that its place in treatment, if any, may be merely to give a flying start to hydroxocobalamin--but abstention from tobacco should probably still remain the most important single treatment. Reasons are given for the suggestion that tobacco amblyopia, and perhaps other toxic amblyopias, are due to direct poisoning at the level of the retina and not in the optic nerve: damage to all layers of the retina in an area with a finger-like shape, based on the disc and pointing towards the macula, would explain the characteristic pattern of scotomata, including the depression of central vision, but a selective effect in the red-sensitive mechanism in the cones may also exist. The postulated selectivity of the toxin for the retina may depend on the dissolution of cyanocobalamin on exposure to light with consequent liberation of cyanide locally in the retina or vitreous. As in so many diseases etiology seems to be multifactorial: indeed tobacco may not be necessary to produce a syndrome similar to tobacco amblyopia. By the same token, there are many people who have a large consumption of tobacco without developing amblyopia, presumably because their metabolism and their diet, especially its content of sulfur-containing amino acids, can cope with the toxin (if it is absorbed). Other factors in those affected are alcohol intake, poor nutrition and/or poor absorption or other metabolic abnormalities. (Auth. Abs. Mod.)

71-0690. Pindborg, J. J., Mehta, F. S., Gupta, P. C., Daftary, D. K., Smith, C. J. **Reverse Smoking in Andhra Pradesh, India: A Study of Palatal Lesions Among 10,169 Villagers.** *British Journal of Cancer* 25(1):10-20, March 1971.

In the district of Srikakulam in Andhra Pradesh in South India the habit of reverse smoking is widespread. In a house to house survey of oral cancer and precancerous conditions, comprising 10,169 villagers, 43.8 percent were reverse smokers; the female:male ratio being 1.7:1. Ten previously undiagnosed cases of oral cancer, 9 located at the palate, were found. The prevalences for leukoplakia, preleukoplakia and leukokeratosis nicotina palati were 4.9 percent, 2.9 percent and 9.5 percent. Of 497 leukoplakias, 422 were located at the palate and 413 of these patients had the habit of reverse smoking. Histologically, 80 percent of 381 palatal biopsies had a hyperorthokeratosis. Epithelial atypia was found in 15.3 percent of leukoplakias, in 3.6 percent of the preleukoplakias, and in 9.1 percent of leukokeratosis nicotina palati. Various explanations for the habit of reverse smoking are suggested and discussed. In addition to reverse smoking, other tobacco habits were also recorded; all habits and oral lesions were compared and have been discussed according to their apparent interrelationships and distribution by sex and age. (Auth. Abs.)

71-0691. Sheiham, A. **Peridontal Disease and Oral Cleanliness in Tobacco Smokers.** *Journal of Periodontology* 42(5):259-263, May 1971.

Dental epidemiological studies were conducted on 2,119 randomly selected employed British persons to determine whether persons stating that they smoked tobacco had poorer oral cleanliness, according to the OHI, and more severe periodontal disease, as assessed by the Periodontal Index. Persons who smoked tobacco had more debris and calculus than nonsmokers. Smokers had more severe periodontal disease than nonsmokers. There was a gradient of oral cleanliness and severity of periodontal disease from low in nonsmokers to high in smokers of 11 or more cigarettes per day. Persons who stated that they smoked 1 to 10 cigarettes per day had less severe periodontal disease and cleaner mouths than those who smoked more. When nonsmokers and smokers with a similar level of oral cleanliness were compared for severity of periodontal disease, the differences were not statistically significant. (Auth. Abs.)

71-0692. Silverman, S. (Jr.) **Current Status of Oral Cancer and Premalignant Lesions.** *Alpha Omegan* 62:143-155, December 1969.

The relationship of age, sex, race and genetics to oral cancer, current mortality rates of oral cancer, and its clinical detection and treatment are reviewed. Various causative factors in premalignant oral lesions and conditions, including tobacco, leukoplakia, lichen planus, dentures, palatal papillary hyperplasia, alcohol and cirrhosis, syphilis, and dental radiation are discussed. The use of tobacco in all forms increases the risk for eventually developing oral carcinoma and appears to be causally related. This is based on the following facts: (1) carcinogenic agents have been isolated from tobacco condensates; (2) tobacco can induce cellular change and tissue atypia; (3) there is increased use of tobacco among patients with oral carcinoma when compared with control groups; (4) tobacco use in various forms has been associated with an unusually high prevalence of carcinoma of specific oral sites; (5) continual smoking appears to be a factor in the development of multiple oral carcinomas; and (6) there is an increased mortality ratio from oral cancer when comparing smokers and nonsmokers.

71-0693. Taylor, G. F., Eddy, T. P., Scott, D. L. **A Survey of 216 Elderly Men and Women in General Practice.** *Journal of the Royal College of General Practitioners* 21(106):267-275, May 1971.

In a clinical survey of 216 elderly people on the lists of general practitioners in England, Scotland, and Wales, there was a high incidence of epithelial and vascular lesions of the tongue, which have previously been shown to respond to treatment with the B group of vitamins and ascorbic acid. The incidence of lesions was related to sex, social class, smoking, peptic ulcer, and frequently to consumption of vegetables and fruit, but was not related to 'living alone' or to age. The predominance of defects in males was associated with a higher incidence of smoking in men and a relationship between smoking and incidence of clinical signs. The difference in experience of smokers and nonsmokers apparent between normals and all those showing clinical signs was highly significant. The sex difference in incidence of lesions was associated with sex differences in smoking habits.

71-0694. Taylor, W., Pearson, J., Kell, R. L., Keighley, G. D. **Vibration Syndrome in Forestry Commission Chain Saw Operators.** *British Journal of Industrial Medicine* 28:83-89, January 1971.

A preliminary investigation was made into the prevalence of the vibration syndrome in employees of the Forestry Commission (Britain). A questionnaire covered 20 randomly selected employees for each of 40 forests chosen at random. The analyses were confined to 711 male employees of whom 142 were chain saw operators. In this number, the prevalence of the vibration syndrome was 44 percent whereas in men who did not handle the chain saw the prevalence was significantly lower at 18 percent. A regional difference was also found. The prevalence of the syndrome was estimated in smokers, ex-smokers, and nonsmokers for both the chain saw users and the controls. The results show that among the chain saw users a significant gradient is apparent (smokers 52 percent, ex-smokers 42 percent, and nonsmokers 25 percent) whereas in the controls the gradient is absent (18, 20, and 17 percent, respectively). This gradient cannot be explained by differences in time of exposure, since all had spent approximately the same length of time using the saw.

71-0695. Tibbling, L., Nilsson, A. **Harmful Clinical Effects of Smoking. The Effect of Smoking on the Central Nervous System.** Complete English translation of "Medicinska Skadeverkningar av Rokning. Rokningens Inverkan pa Centrala Nervsystemet", *Social-Medicinsk Tidskrifts* 2(Special No.):82-84, February 1971.

In this investigation of the effects of tobacco smoking, nicotine, carbon monoxide, and carbon dioxide were studied separately as each affected the central nervous system. Nicotine was found to be the substance in tobacco smoke which had a distinct effect on the CNS in parts of the balance reflex arc, determined more closely to be in the upper reticular formation of the brain stem. The results of electro-nystagmographic experiments indicate that the effect on the CNS is directly related to the effect of nicotine on the brain and that it is not mediated, for example, via catecholamines. A reduction in nicotine sensitivity with repeated tobacco smoking was found.

71-0696. Yerushalmy, J. **The Relationship of Parents' Cigarette Smoking to Outcome of Pregnancy–Implications as to the Problem of Inferring Causation From Observed Associations.** *American Journal of Epidemiology* 93(6):443-456, June 1971.

Nearly 10,000 white and more than 3,000 black women were interviewed early in pregnancy on a variety of medical, genetic, environmental, and behavior variables. The increase in the incidence of low-birth-weight among infants of smoking mothers was confirmed. However, a number of paradoxical findings were observed which raise doubts as to causation. Thus, no increase in neonatal mortality was noted. Rather, the neonatal mortality rate and the risk of congenital anomalies of low-birth-weight infants were considerably lower for smoking than for nonsmoking mothers. These favorable results cannot be explained by differences in gestational age, nor does a "displacement" hypothesis appear reasonable. Among other findings which could not easily be explained: The healthiest low-birth-weight infants were found for couples where the wife smoked and her husband did not smoke; the most vulnerable were produced by couples where the wife did not smoke and the husband smoked. There were great differences in mode-of-life characteristics between smokers and nonsmokers. The latter were more likely to use contraceptive methods, to plan the baby, less likely to drink coffee and hard liquor, and in general appeared to live at a much slower and moderate pace than the smokers. The most puzzling difference is that of age at menarche, which was lower for smoking mothers. These paradoxical findings raise doubts and argue against the proposition that cigarette smoking acts as an exogenous factor which interferes with intrauterine development of the fetus. (Auth. Abs.)

See also, **71-0623**

BEHAVIORAL AND EDUCATIONAL RESEARCH

71-0697. Anker, J. L., Milman, D. H., Kahan, S. A., Valenti, C. **Drug Usage and Related Patterns of Behavior in University Students: I. General Survey and Marihuana Use.** *Journal of the American College Health Association,* 19:178-186, February 1971.

A survey by means of an anonymous, self-administered questionnaire, was undertaken to explore the demographic, personal-social, academic, and drug-related factors of drug usage and related patterns of behavior among college and graduate students of a state university. A total of 6110 undergraduate and 922 graduate responses were acceptable for analysis. The principal results indicate that the continuing increase in drug use is due primarily to cannabis use; 85 percent of undergraduate and 90 percent of graduate drug users smoke marihuana. The prevalence of marihuana use is mainly accounted for by increasing numbers of occasional users (once per month or less). Among the many factors studied were: sex, age, marital status, social class, religion, academic standing and achievement, class attendance, heterosexual and homosexual experiences, dating, mood, relationship to parents, psychiatric history, friends' use, residence, alcohol intoxication, cigarette smoking, and buying and selling of drugs.

71-0698. Baer, D. J., Katkin, J. M. (Jr.) **Limitation of Smoking by Sons and Daughters Who Smoke and Smoking Behavior of Parents.** *Journal of Genetic Psychology* 118(2nd Half):293-296, June 1971.

A sample of 408 white American-born Catholic college students who were active smokers were asked questions related to their own beliefs and behavior about smoking and the smoking behavior of their parents. Daughters were more likely to limit their smoking regardless of the smoking behavior of their parents. When only the mother smoked, the lowest percentage of sons and the highest percentage of daughters limited their smoking. Sons were least likely to believe they smoked too much if only their fathers smoked, while daughters were least likely to do so if only their mother smoked. The contrast of only one parent smoking seems to have a greater effect on the smoking behavior and beliefs of their offspring than the condition where both or neither parents smoke. (Auth. Abs.)

71-0699. Berger, E. M. **MMPI Item Differences Between Smoker and Nonsmoker College Freshmen Males.** *Jour-*

nal of Consulting and Clinical Psychology 36(3):446, June 1971.

The present study consisted of 81 smokers and 59 nonsmokers for the first item of analysis; 60 smokers and 40 nonsmokers for the cross-validation. Smokers were all classified as moderate. Thirty-six items discriminated suggestively, and their content was interpreted as indicating greater nonsmoker aversion to social and other kinds of excitement and greater nonsmoker admission of a lack of confidence generally and socially. Smokers more often admit behavior in conflict with authority and the mores and preference for excitement. Nonsmokers admit more worry about their health. The proportion of cross-validation and suggestively discriminating items in the areas of preference or aversion for a large variety of activities, most or all of which imply excitement or potential excitement, suggests this as the most important finding from the item analysis.

71-0700. Driscoll, P., Battig, K. **The Effect of Filtrate Fractions of Tobacco Smoke on the Avoidance Behavior of Rats Under Extinction Procedure.** *Zeitschrift fur Praventivmedizin* 16(2):197-203, March-April 1971.

The avoidance response times for 4,400 runs in a shuttlebox under extinction procedure were measured for 22 rats, 20 minutes after exposure to filtered and unfiltered cigarette smoke. The test conditions of full smoke (5 and 10 puffs) and charcoal-filtered smoke (10 puffs) differed significantly from the control and Cambridge-charcoal filter conditions (10 puffs) in the direction of inhibiting extinction (i.e., shortening of the response times). As the test conditions of full smoke and charcoal-filtered smoke were the only ones which contained the particulate phase, of which nicotine is pharmacologically by far the most active ingredient, this stimulating effect was attributed to nicotine. The stimulating effect commonly observed in behavioral experiments through nicotine injection has therefore been demonstrated here through the medium of small controlled doses of cigarette smoke, comparable to the non-toxic intake of this substance by humans. (Auth. Abs.)

71-0701. Mork, T. **On Smoking Behaviour.** *UICC Bulletin* 9(1):4-5, March 1971.

The possibilities of influencing smokers so that they abandon their smoking habits are analyzed. It is important to know the motivations involved which may be very varied (compensation for "inferiority", access to a determined social group, establishing a "new identity", pure curiosity, a means to relax or to help in concentration, etc.). The relative failure of many antismoking campaigns indicates that new methods must be developed. In this respect, four important factors should be considered: the message (the real information to be communicated); the communicator; the target group; and the medium.

71-0702. Nevin, M., Wilson-Davis, K., O'Rourke, A., Dean, G. **Drugs—A Report on a Study in Dublin Post-Primary Schoolchildren, 1970.** *Journal of the Irish Medical Association* 64(406):91-100, February 18, 1971.

In a study among Dublin post-primary school children, 2.3 percent of the sample claimed to have experimented with drugs. Over the age of 16 years 4.9 percent claimed they had tried a drug and under the age of 16 it was 1.3 percent. Marijuana was the drug that was most commonly mentioned, and there was no difference between the proportion of girls and boys who had tried smoking marijuana. Very few had experimented with hard drugs and this small group were chiefly boys. In the total school population covered by the survey 1,406, or 25.7 percent, of the pupils said they were regular cigarette smokers. Of the pupils in the sample who claimed to have taken drugs (126 in all) 83, or 66 percent claimed to be regular cigarette smokers. This result is in accordance with previous findings that children who smoke are more likely to take drugs. At present the problem of drug usage by Dublin post-primary school children would appear to be a small one but these children are aware of the current use of drugs to alter mood and suitable steps should be taken to make sure that they understand the dangers of drug addiction.

71-0703. Pratt, L. **The Relationship of Socioeconomic Status to Health.** *American Journal of Public Health* 61(2):281-291, February 1971.

A study was made to see whether a deficient pattern of personal health care was an important mechanism through which poverty affects health. Data from the study support this proposition, and the findings are used to indicate what modifications of behavior might be undertaken. Alcohol and cigarette consumption were included in the poor-health indices. Their consumption was found to be lower among low-income women than among high socioeconomic status women.

71-0704. Shapiro, D., Schwartz, G. E., Tursky, B., Shnidman, S. R. **Smoking on Cue: A Behavioral Approach to Smoking Reduction.** *Journal of Health and Social Behavior* 12(2):108-113, June 1971.

A method of smoking reduction is described which is based on the theory that smoking is a learned habit controlled by specific environmental cues. To break the connection between these cues and the smoking response, the method requires the individual to smoke on a new cue, presented at random times by a portable signaling device. The substitute cue is initially set at the smoker's normal rate and then gradually phased out. Results of a study to test the feasibility of the method indicate that people can follow the program and reduce their smoking without other forms of therapy. (Auth. Abs. Mod.)

71-0705. Sinha, L.N.K., Krishna, K. P. **A Smoking Problem Check-List for College Students.** *Psychological Studies* 15(1):50-54, 1970.

The purpose of the study was to develop a suitable smoking problem check-list (SPC) for college students. The check-list was prepared on the basis of the problems revealed by 25 heavy smokers who approached for psychological assistance, in interviews lasting from 2 to 6 sessions. Finally, a check-list of 35 items was prepared. Both test-retest reliability (r= .77) and odd-even reliability (.93) of the full length check-list were sufficiently high.

The scores on SPC were compared in terms of different personal variables and attitudes towards smoking. A significant positive correlation (.27) was found between scores on SPC and frequency of smoking in a day. (Auth. Abs.)

71-0706. Thomas, C. B., Jones, L. W., Ross, D. C. **Studies on Figure Drawings: Biological Implications of Structural and Graphic Characteristics.** *Psychiatric Quarterly* 42(Supplement):223-251, 1968.

The biological correlates of the structural and graphic characteristics of figure drawings by healthy young adults were investigated. The existence of a number of correlations has been indicated. The final significance of these findings remains to be ascertained, in view of the hypothesis-seeking nature of the present study. Differences between drawings by men and by women were the most outstanding. Minimal differences were found between drawings by smokers and nonsmokers. Measurements of height and body proportion of figure drawings showed little or no correlation with the physiological and metabolic characteristics of the subjects. (Auth. Abs.)

BILLS AND LEGISLATION

71-0707. U. S. Senate and House of Representatives, 91st Congress. **Public Law 91-222. Public Health Cigarette Smoking Act of 1969.** U. S. Senate and House of Representatives, 91st Congress, H. R. 6543, April 1, 1970.

The Act to extend public health protection with respect to cigarette smoking and for other purposes as enacted by the Senate and House of Representatives of the United States is presented as Public Law 91-222 passed on April 1, 1970 and to be cited as the "Public Health Cigarette Smoking Act of 1969".

SMOKING CESSATION METHODS

71-0708. Rosenberg, A. **Viewpoints on Smoking Withdrawal. Viewpoints on Smoking Withdrawal – Copenhagen Experiences.** Complete English translation of "Synpunkter pa Rokavvanjning. Synpunkter pa Rokavvanjning–Erfarenheter fran Kopenhamn", *Social-Medicinsk Tidskrifts* 2(Special No.):108-110, February 1971.

A method for breaking the smoking habit is described in which the psychological and psychic elements of the tobacco habit are treated. The method is based on a breakdown of these elements into perception-physiological effects (the busy element in smoking or tobacco manipulation) and the pharmacodynamic effects. Treatment consists of conversation therapy, autosuggestive exercises in breathing and relaxation, and the use of psychosedatives during the first part of the treatment. The exercises are continued during as much as 12 months. The importance of determining the carboxyhemoglobin content of the patient's blood before and during treatment is emphasized in order to be used as an indication of the positive effect of the treatment: the elimination of CO poisoning in the patient.

71-0709. Wilhelmsen, L. **Viewpoints on Smoking Withdrawal. Smoking Withdrawal Clinic Activity in Goteborg.** Complete English translation of "Synpunkter pa Rokavvanjning. Rokavvanjningsverksamhet i Goteborg", *Social-Medicinsk Tidskrifts* 2(Special No.):116-119, February 1971.

A description of the methods used and the results from experiences in two smoking withdrawal clinics in Goteborg, Sweden, are presented. The first experience involved 291 men and 200 women, of whom 406 completed the treatment. A total of 261 had stopped smoking completely after the cure. The method consisted of daily contacts with the clinic, 20-minute discussions with a physician, and drug therapy for a two-week period. Results indicate that men stopped smoking more easily than women, and that those with a longer smoking history were more successful than those who smoked for less than 10 years and who were younger. Various job conditions and smoking exposure in the environment were also analyzed. The second experience involved heart infarct patients born in 1913 or later cared for at a special heart infarct center. The method consisted simply of advising the patient when he left the hospital of the risks involved. A pamphlet on the effects of smoking and health and which explained how to proceed in breaking the habit was also given to each patient. After one year, 50 percent of the patients had stopped smoking. It appears that serious illness involves a substantially stronger motivation for stopping than do milder illnesses. Generally, the results indicate that 50 percent of those who now smoke can stop relatively easily provided that they are sufficiently motivated. It is thought therefore that more sophisticated methods are not necessary; information of harmful effects and a method of stopping are often sufficient. However, other methods must be developed for those who are more difficult to motivate and thus have more trouble stopping.

See also, **71-0704**

GENERAL

71-0710. Butters, D. **Measurement of Paper Porosity.** *Beitrage zur Tabakforschung* 5(6):307-311, December 1970.

Following a review of some of the special requirements of the cigarette industry in regard to the measurement of paper porosity and some of the existing methods for its measurement, a standard definition of air permeability of a sheet of paper is proposed and an air permeability instrument designed to use this definition is described.

71-0711. Egsmose, T., Stokholm, J., Egsmose, R. **Danske Laegers Holdning til Bekaempelse af Tobaksproblemet. [The Attitude of Danish Doctors Toward a Tobacco Smoking Control Program.]** *Ugeskrift for Laeger* 133(21):1041-1046, May 28, 1971, Danish.

A random-sample questionnaire survey was made of 977 Danish doctors (13.2 percent of the nation's total) during November-December 1970 to determine their attitudes toward a tobacco smoking control program. The responses showed that 24 percent believe that public smoking habits would be influenced if doctors stopped smoking. Of the doctors with children, 80 percent had encouraged their children not to smoke. Eighty percent think that the government should urge antismoking action through information and campaigns in public schools, institutions of higher education, and in mass media. Seventy-one percent feel that a fraction of the tobacco revenues (0.5 to 1 percent) should be used for information and antismoking campaigns. Twice as many support (58 percent) as oppose (28 percent) a total ban on all tobacco advertising.

71-0712. Jones, J. B. **The Smoking Disease. (Letter).** *British Medical Journal* 1(5742):228, January 23, 1971.

A study of cigarette smoking in 775 newly delivered mothers in relation to breast feeding showed a 35 percent incidence among all the cases, 24 percent among smokers and 19 percent among heavy smokers.

71-0713. Little, C. C. **Report of the Scientific Director, 1969-1970.** New York, The Council for Tobacco Research, 1970, 85 pp.

This report reviews current research activities sponsored by the Council for Tobacco Research, including studies on viruses and cancer, and the immunological system; progress on the development of smoking machines; a study on animal skin exposure to a concentrated smoke stream; and experiments on chronic inhalation of smoke and polluted air. Cardiovascular research includes efforts to develop a method for measuring coronary artery blood flow; various studies on the role of smoking, especially nicotine, in the arteriosclerotic process; and a study to determine predictors of early heart disease. Research in the area of chronic respiratory diseases includes investigations on metaplasia in nonsmokers, the relation of antitrypsin deficiency to emphysema, and the effects of cigarette smoke on animal lung function. In the area of neuropharmacology and psychology, studies are concerned with the effects of nicotine and/or smoking on the central nervous system and personality differences between smokers and nonsmokers. Also included are abstracts of 93 reports on new experimental research that have been published since the last report, and a list of active and complete research projects supported by The Council.

71-0714. Medical Journal of Australia. **Smoking and Health Now.** *Medical Journal of Australia* 1(3):109-110, January 16, 1971.

The Royal College of Physicians of London's report, "Smoking and Health Now", is reviewed followed by a few comments on selected aspects of the report, including the value of statistical evidence, the problem of the "safe cigarette" and imprecise mortality estimates in relation to smoking.

71-0715. Nichols, P.J.R., Howell, B. **Routine Pre- and Post-Operative Physiotherapy. Results of a Trial.** *Rheumatology and Physical Medicine* 10(7):321-336, August 1970.

A trial to assess the value of routine pre- and post-operative physiotherapy is described. Patients with respiratory dysfunction and persistent bronchitis were excluded from the trial. Of the 193 patients studied, 109 underwent orthopaedic operations involving the limbs, 32 had operations involving upper abdominal incisions, and 52 had operations involving lower abdominal incisions. The patients were distributed into groups; two groups received routine physiotherapy and two groups did not receive physiotherapy. Two further subdivisions were made, those having daily spirometry tests and those not having spirometry tests. Routine daily physiotherapy had no effect on the incidence of post-operative complications, nor on the incidence of post-operative reduction in pulmonary ventilation. A reduction in post-operative pulmonary ventilation was almost invariable among those patients undergoing upper abdominal surgery, very common among those having lower abdominal incisions, and very rare following orthopaedic operations. The well-known correlation between smoking and bronchitis was confirmed, and a tendency to post-operative complications was more likely in patients who smoked. The significance of the findings is discussed. (Auth. Abs.)

71-0716. Papavassiliou, J., Piperakis, G., Marcelou-Kinti, U. **Mycological Flora of Cigarettes.** *Mycopathologia et Mycologia Applicata* 44(2):117-120, May 3, 1971.

One hundred strains of fungi were isolated from 48 packets of Greek cigarettes. They were: *Aspergillus* (28 strains), *Penicillium* (22), *Mucor* (18), *Alternaria* (14), *Cladosporium* (1), *Streptomyces* (4), *Candida* (11) and *Geotrichum* (2). From 55 packets of cigarettes manufactured outside of Greece another 100 strains of fungi were isolated and identified as *Aspergillus* (35), *Penicillium* (23), *Mucor* (10), *Alternaria* (13), *Cladosporium* (5), *Streptomyces* (4), *Candida* (3), *Geotrichum* (1), *Cephalosporium* (2) and *Scopulariopsis* (4). Results of the present study are discussed in relation to the mycological flora of the air in Athens and to the coli-aerogenes bacteria of cigarettes. (Auth. Abs.)

See also, **71-0580**

CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-0717. Bernhard, P. **The Effect of Smoking on Women and Mothers.** Complete English translation of "Die Wirkung des Rauchens auf Frau und Mutter," *Munchner Medizinische Wochenschrift* 104(39):1826-1831, 1962.

The effects of smoking in 659 female smokers with various medical conditions are compared to those in 5,000 nonsmoking women with the same pathological conditions. The general pathological effects of tobacco smoking in both sexes, such as pulmonary cancer, coronary sclerosis, and Buerger's disease are reviewed. The effect of tobacco poisons on the female sex organs, the hormone glands, and fertility is also discussed. Results indicated pituitary disturbances in 36.2 percent of 659 smokers and in 5.8 percent of nonsmokers. Cigarette smoking was particularly harmful during puberty, because it caused malfunction of the hormonal glands. Developmental disturbances were found in 9.5 percent of smokers and 4.5 percent of nonsmokers, which clearly indicates damage to growth and development in puberty. Early menopause and early aging were also significantly greater in smoking than in nonsmoking women. Occurrence of miscarriage and sterility was again significantly more frequent in smoking than in nonsmoking women. The specific medical bases for nicotine-caused infertility include (1) hormonal infertility due to glandular malfunction; (2) vascular cramps in the area of the sexual organs, especially the ovarian ducts; (3) lack of sexual sensitivity and mental-spiritual disturbances at intercourse; (4) qualitative deterioration of the ovaries; (5) damage to the ovarian ducts; (6) damage to the uterine mucosa as receiver of the ovaries; and (7) damage to the placenta. Some federal communal hygienic demands to combat tobacco smoking are included.

71-0718. Bilimoria, M. H., Nisbet, M. A. **The Effect of Acrolein on L-Asparaginase 2 from** *Escherichia Coli. Proceedings of the Society for Experimental Biology and Medicine* 136(3):698-700, March 1971.

Inhibition studies, carried out using a partially purified L-asparaginase 2 preparation, have indicated that tobacco smoke and a number of reactive smoke components do not cause inhibition. Of the smoke components studied, only acrolein was inhibitory and this inhibition was found to be more marked at pH 8.4 than at pH 5.0. The -SH specific reagents, sodium arsenite and *p*-hydroxymercuribenzoate did not inhibit the enzyme. (Auth. Abs.)

71-0719. Coburn, R. F. **The Carbon Monoxide Body Stores.** *Annals of the New York Academy of Sciences* 174(Art. 1):11-22, October 5, 1970.

Computations of the partial pressure of carbon monoxide (CO) in various tissues, factors influencing CO binding in tissues at a given tissue CO tension, and the effects of increasing the body CO stores on the distribution of CO between blood and muscles or other extravascular tissue are examined. A substantial fraction of the extravascular CO stores are located in muscle but it cannot be precisely determined due to uncertainties in total body myoglobin in experimental animals and variation in myoglobin concentration and carboxymyoglobin percent saturation in different muscles. The finding of carboxymyoglobin/carboxyhemoglobin of nearly 3 percent in myocardium at ambient arterial oxygen tensions suggests that as much as 30 percent of cardiac myoglobin may be saturated with CO in heavy cigarette smokers who may carry carboxyhemoglobin levels of 10-percent saturation. The shift of CO into myocardium that occurs with arterial hypoxemia and also with shock may be a factor in CO toxicity to the myocardium and may be of particular importance in patients with coronary disease. The finding that the partition of CO between blood and extravascular tissue over a wide range of arterial oxygen pressure is constant indicates that blood carboxyhemoglobin/carboxyhemoglobin is no longer proportional to the body stores under these conditions and thus is not a good index of tissue CO binding. Extravascular CO stores in the tissue of other organs, particularly the liver, are briefly examined. Processes that influence the body CO stores are discussed, in particular, the relationship of production and excretion, and blood carboxyhemoglobin to endogenous CO production; CO metabolism; rates of endogenous CO production at increased levels of carboxyhemoglobin; and a comparison of the rate of CO production and blood carboxyhemoglobin.

71-0720. Das, P. K., Rathor, R. S., Sinha, P. S., Sanyal. A. K. **Effect on Ciliary Movements of Some Agents Which Come in Contact With the Respiratory Tract.** *Indian Journal of Physiology and Pharmacology* 14(4):297-303, October 1970.

The effect of a number of agents which are either inhaled or excreted through the respiratory tract or are used for the treatment of inflammatory conditions of the respiratory tract was studied on ciliated epithelium of frog's esophagus. All the agents studied were dissolved in normal Ringer solution. The ciliary motility was found to be stimulated by very weak solution of ethanol (0.02 percent), ether, paraldehyde, oil of peppermint, menthol guaiacol, creosote, oxygen, carbon dioxide and cigarette smoke. Relatively higher concentrations of ethanol (0.1 to 1.0 percent), chloroform, thymol, petrol gas, potassium iodide and potassium bromide were found to depress ciliary motility. The stimulant actions did not appear to be mediated by neuro-humoral mechanisms. The action of carbon dioxide was not due to any change in hydrogen ion concentration, and the effect of cigarette smoke was possibly not due to the presence of nicotine. Of the three anions, (chloride, bromide and iodide), the iodide ion was the most depressant. (Auth. Abs. Mod.)

71-0721. Forbes, W. H. **Carbon Monoxide Uptake Via the Lungs.** *Annals of the New York Academy of Sciences*

174(Art. 1):72-75, October 5, 1970.

The balance between the taking up and the giving off of carbon monoxide (CO) in the lungs is reviewed and a numerical example of a common type of CO exposure is described. The details of the movement of atmospheric CO on its way to combine with hemoglobin are discussed and probable reasons for the rather large differences in carboxyhemoglobin between individuals are suggested. The elimination of CO from the blood and resuscitation of persons with carbon monoxide poisoning are mentioned.

71-0722. Gothert, M., Lutz, F., Malorny, G. **Carbon Monoxide Partial Pressure in Tissue of Different Animals.** *Environmental Research* 3(4):303-309, 1970.

A pneumoperitoneum of nitrogen was set to rabbits, guinea pigs, and rats, and the CO partial pressure was measured in this tissue model of the animals, breathing 86, 300, 700, and 1000 ppm CO. After diffusion equilibrium had been reached, the following results were observed: (1) the CO partial pressure in tissue is only 42-69 percent of the CO partial pressure in the inspired air; (2) the percentage CO partial pressure in tissue compared with the CO partial pressure in the inspired air is lower, the higher the CO content of the inspired air; (3) the CO partial pressure in tissue of a species of animal is lower, the higher the CO affinity of hemoglobin. The results can be explained by the competition of CO and O_2 for the receptor hemoglobin. The CO partial pressure in tissue is influenced decisively by the different CO and O_2 affinities of hemoglobin. (Auth. Abs. Mod.)

71-0723. Hess, H. **A Contribution to the Problem of "Passive Smoking."** Complete English translation of "Zum Problem des 'Passiv-Rauchens'," *Munchner Medizinische Wochenschrift* 113(18):705-706, April 30, 1971.

A rebuttal by H. Hess to H.-P. Harke's criticisms of his paper on passive smoking is presented. Harke's main criticism concerned Hess's estimation that a nonsmoking waitress working in a heavy smoke-infested restaurant inhales in one hour an amount of nicotine equivalent to that obtained by smoking one cigarette. The measuring values on which these calculations were based are discussed and it is shown that even if these values are substituted by those used by Harke, the results are still equivalent to the nicotine volume of one cigarette per hour. Hess also argues that in Harke's study, the unventilated room test was stopped at a point when passive smoking had just reached its peak and the passive smokers could only have inhaled a small amount of nicotine by that time. In Harke's ventilated room test, passive smokers excreted almost 50 percent more nicotine than in the unventilated room test, a descrepancy that was ignored. Hess also views some of his own results as evidence of vascular damage due to passive smoking.

71-0724. Ivancev, V., Dragiev, M. **Experimental Investigations on the Microclimate of Tobacco Fermentation Chambers. IV. Histochemical Changes in the Catecholamines of the Medullar Part of the Suprarenals in Rabbits.** *Folia Medica* (Plovdiv) 11(6):388-392, 1969.

The effect of toxic substances formed during fermentation of tobacco on the catecholamine granules of the cells of the medullar part of the suprarenals in rabbits was investigated. Results showed that on the 5th day of the effect, the catecholamine positive granules were markedly decreased, while after the 10th day, total degranulation took place. The catecholamine degranulation was due either to the increased secretion of catecholamines principally under the effect of nicotine or to the dystrophic and metabolic changes of the suprarenal medullar part under the effect of other toxic substances.

71-0725. Ivanov, N. G., Mokhachev, I. G., Astakhova, L. G. **Volatile Fatty Acids in Tobacco.** Complete English translation of "Letlivi Mastni Kiselini v Tyutyuna," *Bulgarski Tyutyun* 14(4):60-62, 1969.

Gas chromatography was used to determine the qualitative structure and quantity of volatile acids in fermented Bulgarian tobacco of the following types: Asenovgrad III class, Momchilgrad III and V classes, and Ostrolist 450. The following acids were identified: formic, acetic, propionic, isobutyric, acrylic, normal butyric, isovaleric, isocaproic, beta-methylvaleric, normal caproic and two unidentified. Acetic acid was found in the largest quantities. Its quantity decreases in relation to other acids as the quality of the tobacco, in particular the smoking quality, increases. Formic acid follows a similar pattern. In terms of total quantity of volatile acids, acetic and formic acids comprised 33.3 percent in the Momchilgrad III class, 41.6 percent in the Momchilgrad V class, 51 percent in the Asenovgrad III class, and 70.3 percent in Ostrolist 450. The C_3-C_7 acids, and particularly beta-methylvaleric acid, appear to be related to the aromatic qualities of tobacco.

71-0726. Izard, C., Moree-Testa, P. **Activite Mitoclasique et Aberrations Chromosomiques Induites par l'Alpha et le Beta-Naphtonitrile, Identifies Dans une Fraction de Goudron de Fumee de Cigarette. [Mitoclastic Activity and Chromosomal Aberrations Induced by Alpha and Beta Naphthonitrile Identified in a Cigarette Smoke Tar Fraction.]** *Comptes Rendues Hebdomadaires des Seances de l'Academie des Sciences; D: Sciences Naturelles* 272(20):2581-2583, May 17, 1971, French.

Alpha and beta-naphthonitrile have been identified in the II fraction of cigarette smoke. They are in part responsible for its mitoclastic activity. From this point of view, the beta derivative is the less active. Otherwise, both nitriles have an equal activity at the G_2 and prophase levels.

71-0727. Jacotot, B., Rambaud, J., Denis, J.-C., Cahn, J., Buxtorf, J.-C., Patois, E., Beaumont, J.-L. **Prevention par la N-Acetyl-hydroxyproline de Certains Effets Aigus et Chroniques de la Nicotine. [Prevention of Certain Acute and Chronic Effects of Nicotine With N-Acetyl-hydroxyproline.]** *Pathologie Biologie* 19(9/10):497-502, May 1971, French.

N-acetyl-hydroxyproline has been shown to reduce or inhibit certain cardiovascular or convulsive effects of nicotine in animals and man. This protective effect was noted particularly on the immediate effects of injection of nicotine in animals, e.g., convulsions in the rabbit and mouse, electrocorticographic changes in the rabbit, and the immediate cardiovascular effects in man after inhalation of cigarette smoke (tobacco test). These fairly concordant results raise numerous questions concerning the mode of action of N-acetyl-hydroxyproline. (Auth. Abs. Mod.)

71-0728. Jaffe, L. S. **Sources, Characteristics, and Fate of Atmospheric Carbon Monoxide.** *Annals of the New York Academy of Sciences* 174(Art. 1):76-88, October 5, 1970.

Carbon monoxide, principally a man-made pollutant, is the most abundant air pollutant found in the lower atmosphere, excluding carbon dioxide. Total emissions of CO from technological sources alone generally exceed those of all other air pollutants combined, with the total tonnage in the United States alone estimated to be 102 million tons. Fuel combustion by motor vehicles is by far the principal source. Industrial processes and miscellaneous man-made combustion (including structural and agricultural fires, coal banks, detonation of explosives, and the smoking of cigarettes) are the second and third largest technologial sources of CO. Although relatively insignificant amounts of atmospheric CO are produced by cigarettes, cigarette smoke is, nevertheless, a major source of personal air pollution in smokers. Carbon monoxide emission from cigarettes is estimated to be about 0.01 million tons per year based on an annual consumption of 539 billion cigarettes that emit on the average of 16.2 mg per cigarette.

71-0729. Magee, P. N. **Toxicity of Nitrosamines: Their Possible Human Health Hazards.** *Food and Cosmetics Toxicology* 9(2):207-218, April 1971.

No animal species have been reported to be resistant to carcinogenesis by the nitroso compounds. Experimental work in the rat indicates that most organs are sensitive to one or more nitroso carcinogens and recent reports suggest that this may be true for other species as well. The nitroso compounds have many of the properties that might be predicted for an environmental carcinogen to which man is susceptible. Formation of carcinogenic nitrosamines from secondary amines and nitrites in the human stomach has been demonstrated and simultaneous feeding to rats of secondary amines and sodium nitrite has produced tumors. Nitrites are present in the environment and are used in many countries as food additives. Nitrates are widely distributed in soils and plants and microorganisms capable of catalysing the reduction of nitrates to nitrites have a wide distribution. Secondary amines may be present in various foods, including vegetables, fish, mushrooms, cheese and fruit, as well as in wine, beer and some drugs. Amines may also occur in tobacco and tobacco smoke. Thus, variable small amounts of nitroso carcinogens may be absorbed, either directly from the environment or after formation in the alimentary tract, over long periods of time. The hazard of exposure to these low concentrations is difficult to assess in the absence of reliable data on dose-response relationships at low dose levels.

71-0730. Malmejac, J., Schlotterer, M., Wassermann, D. **Nicotine et Propranolol. [Nicotine and Propranolol.]** *Journal de Physiologie* 63(2):74A, March-April 1971, French.

A preliminary communication of results from a study of the antagonistic action of propranolol on the cardiovascular effects of nicotine in dogs is presented. It appears that the principal influence of a beta-receptor blocking agent on the hypertension produced by nicotine is primarily of cardiac origin. This blocking action produced by propranolol on the beta cardiac receptors reduces the ortho-sympathetic action and favors a depressive effect on the heart. At the same time, the cardio-moderating effects are reinforced.

71-0731. Miller, R. L., Stedman, R. L. **Alkylphenols and Arylnitriles in a Biologically Active Neutral Subfraction of Cigarette Smoke Condensate.** *Phytochemistry* 10(5):1135-1140, 1971.

A tumorigenic neutral subfraction of cigarette smoke condensate eluting from silicic acid with benzene and soluble in dimethylsulfoxide was shown to contain the following constituents: 2-butylphenol; 2-isobutylphenol; 2-ethyl-6-methylphenol; 3-ethylbenzonitrile; 2,5-dimethylbenzonitrile; 2-ethylbenzonitrile; 2,6-dimethylbenzonitrile; 4-ethylbenzonitrile and 2,3-dimethylbenzonitrile. Evidence was also obtained for the presence of 2-methylbenzonitrile and 2-ethyl-5,6-dimethylphenol. None of these components has been reported previously in condensate. The partition coefficients in ether/1N NaOH ranged from 1.1 to 44 for the four phenols, indicating that their occurrence in the neutral fraction would be expected. The amounts of constituents that were isolated and identified ranged from 0.6 to 2.2 mg/kg smoke condensate. (Auth. Abs.)

71-0732. Otis, A. B. **The Physiology of Carbon Monoxide Poisoning and Evidence for Acclimatization.** *Annals of the New York Academy of Sciences* 174(Art. 1):242-245, October 5, 1970.

Studies concerned with the question of whether or not acclimatization to carbon monoxide (CO) occurs, and if so, the physiological changes involved, are reviewed. In one experiment, 14 of 19 mice previously exposed to CO survived for more than 14 minutes. Mice exposed to a simulated altitude (16,000 to 18,000 feet) showed an increased tolerance to CO, 60 percent surviving 0.25 percent CO for 9 days and no controls surviving for more than 1 1/2 days. Blood studies showed, for both the simulated altitude and CO exposures, an increase in blood hemoglobin concentration of about 50 percent of control values. However, the standard bicarbonate of the mice exposed to CO increased slightly, whereas that of mice exposed to low oxygen decreased substantially. This difference was attributed to the fact that animals exposed to low oxygen hyperventilate and compensate by excreting bicarbonate, whereas animals exposed to CO are less apt to increase their ventilation. Most of the increased hypoxic tolerance can be explained as a result of the increased circulating hemoglobin.

71-0733. Portheine, F. **A Contribution to the Problem of "Passive Smoking."** Complete English translation of "Zum Problem des 'Passiv-Rauchens'," *Munchener Medizinische Wochenschrift* 113(18):707-709, April 30, 1971.

The presence of toxic volatile components in sidestream smoke necessitates the protection of nonsmokers forced to breathe in this contaminated atmosphere. The complex electro-physical peculiarities of the smoke render its measurement difficult. In exceedingly smoky rooms, an intensive spontaneous sedimentation may take place and the detection of the smoke by an individual days or even weeks later need not be attributed to a hypersensitivity or allergy. Portheine offers some criticism of the experiments conducted by Harke: experimental conditions in the test chamber gave no indication of the vapor concentration, reduced visibility and dust content; the phenomena of excessive condensation and absorption were not sufficient for an explanation of the results; and the Draeger carbon monoxide measuring apparatus and the analytical methods were unsuitable for the determinations. Portheine also discusses the influence of a diet deficient in meat and uncooked food an the undesirable effects of nicotine on nonsmokers, the concentration of carbon monoxide in traffic and in vehicles and closed areas, the effect of carbon monoxide on carboxyhemoglobin levels in passive smokers, and the need for stricter maximum allowable concentration levels for carbon monoxide.

71-0734. Putney, J. W. (Jr.), Borzelleca, J. F. **On the Mechanisms of ^{14}C-Nicotine Distribution in Rat Submaxillary Gland** *In Vitro. Journal of Pharmacology and Experimental Therapeutics* 178(1):180-191, July 1971.

The uptake and efflux of nicotine (N-methyl-^{14}C) were studied under various incubation and washout conditions. The 60-minute ^{14}C-nicotine space at an extracellular pH of 7.40 was 4.037 ± 0.255 (S.E.) ml/g. Elevation or depression of extracellular pH brought about a significant increase or decrease, respectively, in the ^{14}C-nicotine space. In all cases, the intracellular/extracellular ratios were greater than those calculated from the intracellular pH determined by 5,5-dimethyloxazolidine-2,4-dione-2 ^{14}C distribution. CN^-, 10^{-5} M, or an increase (X 100) in the extracellular concentration of nicotine did not affect the 60-minute spaces. Temperature dependence of the 60-minute spaces was observed but could be explained solely by the effect of temperature on the pK_a of the drug. Increasing or decreasing pH during efflux significantly decreased and increased the observed rate constants. It is concluded that the uptake of ^{14}C-nicotine by submaxillary glands occurs by passive diffusion of the unionized species across the cell membrane and is followed by binding to intracellular sites and/or partitioning of the un-ionized drug into lipid compartments. The rate-limiting step in efflux is the dissociation of the drug from the cell membrane. The dissociation is greatly facilitated by the collision of a proton from the extracellular hydrogen ion pool. (Auth. Abs.)

71-0735. Sandrucci, M. G., Colla, G. **Nepiopharmacology From the Obstetric Viewpoint.** Complete English translation of "Nipiofarmcologia dal Punto di Vista Ostetrico," *Minerva Nipiologica* 18(2):27-43, March-April 1968.

A two-fold study was made of a wide range of pharmaceuticals which normally have been administered to pregnant women: (1) those drugs which might have a possible pathological effect on the fetus or neonate; and (2) those which are eliminated through the milk and which may have a harmful effect on the nursing infant. The report includes a number of comments on smoking and nicotine. Smoking can reduce the quantity of secreted milk but rarely has a toxic action on the nursing infant. Bisdaniw has noted a case of poisoning characterized by restlessness, vomiting, diarrhea, and tachycardia in a nursing infant of 6 weeks whose mother had smoked about 20 cigarettes per day. Similar phenomena had been noted by Herriot and Ballewicz. Hatcher and Crosby, in 1927, had found 0.015 mg of nicotine in a 26-cc sample of milk from a woman who had smoked 7 cigarettes 2 hours earlier. Emanuel had been able to observe the presence of nicotine in the milk of women who had smoked more than 7 cigarettes within 1 to 2 hours. The quantity of nicotine eliminated by this route was higher if the smoke had been inhaled. He noted a maximum quantity of 0.03 mg after smoking 15 cigarettes, a dosage considered dangerous for the nursing child since a dose of 1-4 mg is toxic for adults. Emanuel has not encountered harmful effects in the nursing infant except for 2 cases of alterations of the abdomen and the relationship of these with nicotine was debatable. More recently Perlman, et al, observed very high concentrations of nicotine (0.116 to 0.5 mg/l) in the milk of smoking mothers. Burn has observed concentrations of 0.4 to 0.5 mg/l in the milk of women who had smoked 11-20 cigarettes per day. The rarity of these toxic phenomena in nursing infants can be attributed to the adaptability of the fetus to the nicotine passing through the placenta.

71-0736. Stupfel, M. **L'Organisme de l'Homme, Source de Pollution Gazeuse Pour son Micro-Environment. [Man's Organism, Source of Air Pollution for His Micro-Environment.]** *Medecine et Hygiene* 29(969):1062-1065, June 23, 1971, French.

A review of how man himself pollutes his immediate respiratory environment is presented. In addition to odors and carbon dioxide, man produces a more dangerous pollutant: carbon monoxide. In his closed working environment, in his car, in his home, and even in his places of entertainment, his environment becomes polluted by carbon monoxide produced by his own respiratory system in addition to that produced by his car, by his kitchen, and most important, by his smoking of cigarettes. Details from recent studies of specific biological effects of CO are presented. The difficulty of studying the total effect of man's own pollution of his environment is discussed, suggesting the need for further studies and for the establishment of preventive measures.

71-0737. Swartz, H. **Tobacco Smoke: A Noxious Air Pollutant. A Review (and Comment). Part I of II.** *Review of Allergy* 25(4):397-405, April 1971.

Tobacco smoke qualifies as one of the numerous air pollutants. Even though a great part of tobacco smoke is expelled indoors, it still finds its way to the outside atmosphere through diffusion. The fundamental significance underlying the consideration of tobacco smoke as an important air pollutant is its effect on nonsmokers as well as its exaggerated effect on the smoker. Cigarette smoke contains carbon monoxide and nitrogen dioxide in amounts that expose both smokers and nonsmokers to a toxic hazard. Other toxic agents in cigarette smoke include hydrocyanic acid, acrolein, aldehydes, phenols and carcinogens. Epidemiologic and physiologic study have shown that cigarette smoking contributes to the onset and progression of cardiovascular disease, especially to death from coronary heart disease. Smoking has also been related to peripheral vascular conditions, blood changes, chronic obstructive pulmonary disease, lung cancer, oral cancer, laryngeal cancer, urinary tract cancer, and pancreatic cancer. Tobacco smoking during pregnancy leads to increased prematurity and decreased birth weight. Smoking contributes to peridontal disease and gingivitis, alveolar bone loss, stomatitis nicotina and may be associated with delayed socket healing and edentulism. The senses of smell, taste, hearing and sight are also affected by smoking. The synergism between air pollutants and smoking does not involve two separate etiological groupings but variations in concentration and mode of delivery of respiratory irritants to the lung. Some of the synergists of tobacco smoke briefly discussed include beryllium, molybdenum, vanadium, arsenic, asbestos, sulfur dioxide and gasoline combustion products, particularly carbon monoxide, lead and nitrogen dioxide.

71-0738. Swartz, H. **Tobacco Smoke: A Noxious Air Pollutant. A Review (and Comment). Part II of II.** *Review of Allergy* 25(5):490-505, May 1971.

The combustion products of tobacco are a melange of particulate and gaseous substances derived from tobacco itself, its additives, preservatives and pesticides. The particulate phase is a multifaceted mixture of alkaloids, bases, acids, phenols, alcohols, ketones, hydrocarbons, complex neutral tars and pyridine. The gaseous phase consists of nitrogen dioxide, carbon monoxide, hydrogen sulfide, hydrocyanic acid, arsenic as triphenyl arsene and other compounds. The particle size in tobacco smoke is important since the efficiency of lung clearance of particulare matter is in part determined by particle size. Various effects of tobacco combustion products on the bronchopulmonary apparatus and the carcinogenicity and toxicity of various smoke constituents are discussed. One etiologic aspect of tobacco smoke which has been little investigated is its allergenicity, an aspect which when better delineated may lead to a better understanding of the relationship between smoking and health. The synergism between various other-source air pollutants and tobacco smoke have been shown to lead to more certain deterioration of health in general. And although most studies have dealt with the smokers themselves, there is evidence that the nonsmoker in smoke-contaminated air may become its victim. Tobacco smoke, although largely an indoor air pollutant, plays a role in the overall pollution of the outdoor air. The ideal method to control air pollutants is to eliminate their cause but in the case of smoking this is a practical impossibility. For the home, the office and other relatively small indoor areas, the two-stage portable electrostatic precipitator is the air cleaner of choice. The proper size precipitator will remove a major percentage of submicronic-size particulate matter, thus freeing the air of tobacco smoke as well. The precipitator, however, has little effect on the gaseous phase of the air. Theoretically and from a public health viewpoint, widespread use of electrostatic precipitators would in some degree diminish outdoor air pollution.

71-0739. U.S. Department of Health, Education, and Welfare, Public Health Service, National Clearinghouse for Smoking and Health. **Bibliography on Smoking and Health–1970.** U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration, National Clearinghouse for Smoking and Health, Rockville, Maryland, Public Health Service Publication No. 1124, Public Health Service Bibliography Series No. 45, April 1971, 351 pp.

This bibliography contains over 1300 items which are categorized into the following aspects of smoking and health: 1) chemistry, pharmacology and toxicology; 2) mortality and morbidity; 3) neoplastic diseases; 4) nonneoplastic respiratory diseases; 5) cardiovascular diseases; 6) other diseases and conditions; 7) behavioral and educational research; 8) tobacco economics; 9) smoking cessation methods; 10) bills and legislation; 11) general. An author and organizational index, which includes titles, and a subject index are appended.

71-0740. Yamamoto, I., Inoki, R., Kojima, S., Tamari, Y. **Action of Tyramine on the Salivary Amylase Secretion From Rabbit Parotid Gland in Reference to That of Nicotine.** *Japanese Journal of Pharmacology* 21(1):13-22, February 1971.

The present experiment was mainly carried out to clarify difference in mechanism of actions between nicotine and tyramine on amylase and protein secretion induced by auriculotemporal nerve stimulation in rabbit parotid glands. The increases in amylase secretion produced by tyramine and nicotine were inhibited by propranolol, but not by phenoxybenzamine. Bretylium did not inhibit the actions of either tyramine or nicotine. Sympathetic denervation predominantly inhibited the action of tyramine, but not that of nicotine. In reserpinized rabbits, the increasing action of nicotine was not suppressed, but that of tyramine was. Adrenalectomy showed a complete inhibition of the nicotine action, but the action of tyramine still remained. From these results, the effect of tyramine on amylase secretion is due to catecholamine released from the store of sympathetic nerve terminal, while that of nicotine is due to catecholamine released from adrenal glands. (Auth. Abs.)

See also, **71-0755, 71-0768**

MORTALITY AND MORBIDITY

71-0741. Gyselen, A. **De Etiologie van het Bronchuscarcinoom. [Etiology of Bronchial Carcinoma.]** *Tijdschrift voor Geneeskunde* 26(23):1211-1214, December 1, 1970, Dutch.

The report deals mainly with the effect of cigarette smoking on mortality. Data from major investigations of various types (epidemiological, retrospective, prospective, anatomo-pathological and experimental) all show a higher mortality for smokers as compared with nonsmokers. The smoker–nonsmoker mortality ratios range from 10.8:1 for lung cancer, 6.1:1 for bronchitis and emphysema, 5.4:1 for laryngeal cancer to 1.5:1 for kidney cancer, for an overall 1.6:1 average for all diseases. The ratios vary with higher mortality rates more for heavy smokers than for light smokers. The mortality rates for pipe- and cigar smokers are only 1.5 to 2.25 times greater for smokers than for nonsmokers. Air pollution also plays a role in the etiology of bronchial cancer and clinical experience demonstrates that a genetic predisposition to cancer exists. Smokers of the C.A.R.A. groups (chronic bronchitis, bronchial asthma and emphysema) also have a higher incidence of bronchial carcinoma. Prevention of bronchial cancer rests on control of air pollution as well as on a vigorous antismoking campaign, especially among young people. Meanwhile, all male heavy smokers above the age of 45 years, especially those with chronic cough, are urged to have periodic chest X-rays.

71-0742. Sterling, T. D. **A Review of the Claim That Excess Morbidity and Disability Can Be Ascribed to Smoking.** *Journal of the American Statistical Association* 66(334):251-257, June 1971.

A report from the U.S. Department of Health, Education, and Welfare entitled, "Cigarette Smoking and Health Characteristics" is criticized on two accounts. First, the data presented in the report may not warrant the conclusion that cigarette smoking leads to increases in disease and disabilities. Female smokers, taken as a group, by and large report fewer diseases and disabilities and their prevalence rates are generally smaller than those for nonsmokers. Moderate smokers (less than a half or less than a full pack a day) often report the fewest number of diseases and have the lowest prevalence rates for both men and women. If the conclusions of the report hold, they do so only for heavy smokers who comprised less than half of the sample. Second, inadequate attention was paid to the potential influences of various aspects of the survey method used on the findings. Specifically, there appear to be a number of obvious sources of bias and error for which adjustments were not made.

71-0743. Taylor, W. F. **The Probability of Fetal Death.** In: Fraser, F.C., McKusick, V.A. (Editors). *Congenital Malformations.* Proceedings of the Third International Conference, The Hague, The Netherlands, September 7-13, 1969. Amsterdam, Excerpta Medica, August 1970, pp. 307-320.

The risk of fetal death was investigated in 16,170 single pregnancies at Kaiser Hospital in Oakland, California, during the period from May 1959 to December. Results showed that lesser educated women are less exposed to observed fetal deaths than educated women because they come under observation later in pregnancy. The remaining results were based on only 10,789 single pregnancies in white women; data for other ethnic groups were so variable and difficult to explain that they were set aside for a later detailed analysis. These data showed a rapid drop in the risk of fetal deaths followed by a flattening out at six months, then a perceptible rise again after eight months. The oldest group of women, 30 or over, had a slightly higher risk of having their pregnancies end in fetal death. Higher gravidity woman (four or more previous pregnancies) had a comparatively higher fetal death experience, but there appeared to be no difference between women in their first pregnancy and women who had had 1-3 previous pregnancies. There was no difference in fetal death between high school graduates and nongraduates, but college women had a very slight decrease. The probability of fetal death occurring after three months of pregnancy (Q3) was used as an overall measure in comparing smokers to nonsmokers with regard to education, previous pregnancies and age. The differences were very small at all education levels, with smokers being slightly better than nonsmokers in that they had a slightly smaller value for Q3. In previous pregnancies, smokers were also slightly lower than nonsmokers in this index. There was an apparent excess of fetal death among young smokers and an excess of fetal death among nonsmokers over 30. Age apparently had little effect on smoking mothers but had a rather strong effect on nonsmoking mothers.

See also, **71-0739**

NEOPLASTIC DISEASES

71-0744. Althoff, J., Wilson, R., Mohr, U. **Diethylnitrosamine-Induced Alterations in the Tracheobronchial System of Syrian Golden Hamsters.** *Journal of the National Cancer Institute* 46(5):1067-1071, May 1971.

Diethylnitrosamine-induced alterations in the tracheobronchial system of Syrian golden hamsters were studied with semithin techniques. Hyperplasia and dysplasia of the epithelium seemed to precede papillary tumor development. These morphological patterns were repeated in the tumor epithelium. No evidence was found for metaplastic change to squamous epithelium either in the altered tracheobronchial or tumor epithelium. (Auth. Abs.)

71-0745. Basu, B. K., Ghosh, T. N. **A Study of Bronchogenic Carcinoma.** *Indian Journal of Chest Diseases* 13(1):1-9, January 1971.

The total admissions at Silver Jubilee Tuberculosis Hospital, Delhi, India, during the period January 1966 to December 1969 were reviewed and analyzed for incidence of bronchogenic carcinoma. The disease was detected in 24 patients, as confirmed by histological examinations of the growth, lymph node or rib. Of these patients, 19 males and 1 female were smokers (moderate to heavy). Clinical, radiological and histological evaluations were made and compared with those by other authors.

71-0746. Bazell, R. J. **Smoking Dogs: Tobacco Institute Tries to Discount Cancer Studies.** *Science* 170(3957):515, October 30, 1970.

A detailed account is given of the controversy between the Tobacco Institute and the American Cancer Society concerning an experiment conducted by Oscar Auerbach and E. Cuyler Hammond which claimed to have induced lung cancer in beagles with cigarette smoke. The various problems encountered by the authors in getting their work published and the Tobacco Institute's efforts to discredit their findings are described.

71-0747. Calafat, J., Den Engelse, L., Emmelot, P. **Studies on Lung Tumours. II. Morphological Alterations Induced by Dimethylnitrosamine in Mouse Lung and Liver and Their Relevance to Tumourigenesis.** *Chemico-Biological Interactions* 2(4):309-320, December 1970.

The ultrastructural effects of 100 or 200 mg dimethylnitrosamine (DMNA)/kg body weight on lung and liver cells of two strains of mice were studied. The morphological changes in corresponding cell types were indistinguishable for the two strains. The tumorigenic response to low doses of DMNA has previously been found to be quite different. Changes in the cytoplasm were observed first in the liver, whereas nuclear alterations were found first in the bronchiolar epithelium in which the segregation of nucleolar components was detectable within 1 hour in all cells. Alterations in the morphology of the nuclei were similar to the effects of other carcinogens like lasiocarpine, aflatoxin and 4-nitroquinoline-N-oxide. The relation between morphological and tumorigenic effects of DMNA is discussed. (Auth. Abs.)

71-0748. Cawson, R. A. **The Smoking Disease. (Letter)** *British Medical Journal* 1(5742):228, January 23, 1971.

This letter-to-the-editor criticizes an article which appeared in this journal for linking cigarette smoking to oral cancer. In addition to citing a steady decline in oral cancer among males for the past 50 years, studies are mentioned which failed to show any significant relationship between oral cancer and cigarette smoking.

71-0749. Delarue, N. C., Pearson, F. G., Thompson, D. W., Van Boxel, P. **Sputum Cytology Screening for Lung Cancer.** *Geriatrics* 26(8):130-143, August 1971.

Sputum cytology screening for lung cancer is one of the most important measures in establishing the presence of the disease in patients with symptoms or signs which indicate that a tumor may be responsible for the clinical or radiological findings. In these cases, the additional supportive evidence provided by the recovery of a positive sputum cytology assists in early localization, and with prompt treatment, many if not all of the lesions may prove curable. On the other hand, screening for totally occult disease, in which there are no clinical findings and the chest X-rays prove unrewarding, has such a poor yield (0.1 percent) of favorable case material that its routine application to the general smoking population is neither practical nor economically feasible. Consequently, screening of asymptomatic cigarette smokers should be directed at that segment of this high-risk population in which cigarette smoking acts in concert with some other significant form of atmospheric pollution, industrial or otherwise. For maximum dividends, at least 5 samples of sputum should be made available to the cytologist and preferably a combined sampling should be attempted using both specimens obtained by deep morning cough and those produced following aerosol induction of sputum. If truly occult disease is to be recognized at the earliest possible stage in the natural history of lung cancer, a lengthy and continuing investigation is required for those who show malignant cells in their sputum and for those continuing smokers who already show significant dyskaryotic change. In general, X-rays and sputum cytology should be repeated initially in three-month and then at six-month intervals. Bronchoscopy and bronchograms are indicated whenever the sputum examination records the presence of frankly malignant cells–whether on the primary examination or during repetitive recall–and whenever other symptoms or signs develop which might be related to a progressive change in the epithelial reaction. (Auth. Abs.)

71-0750. Doll, R. **Practical Steps Towards the Prevention of Bronchial Carcinoma.** *Scottish Medical Journal* 15:433-447, 1970.

Evidence is surveyed for the carcinogenicity of nickel, chromate, mustard gas, arsenic, coal tar, asbestos, ionizing radiations, tobacco smoke, their interactions and air pollution with respect to bronchial carcinoma. Prospective studies have shown that mortality from bronchial carcinoma is higher in smokers than nonsmokers, in cigarette smokers than in pipe or cigar smokers, in heavy smokers than in light smokers, and in continuing smokers than in ex-smokers. It is estimated that smoking is responsible for approximately 93 percent of all cases of bronchial carcinoma among men in the general population. Two studies demonstrating the interaction of smoking with two different carcinogenic agents (asbestos and ionizing radiation) are reviewed. Practical measures for the prevention of the disease, including reduction of smoking, regulations controlling industrial carcinogens, banning cigarette advertising, and developing a safe cigarette, are discussed.

71-0751. Eye, Ear, Nose and Throat Monthly. **Tobacco Institute vs. American Cancer Society.** *Eye, Ear, Nose and Throat Monthly* 49(6):14, June 1971.

The latest controversy between the Tobacco Institute and the American Cancer Society concerns the latter's refusal to allow an evaluation of a study entitled, "The Effects of Cigarette Smoking Upon Dogs" by an independent group of scientists selected and supported by the Tobacco Institute. According to the American Cancer Society, the experiment demonstrated that lung cancer can be produced in animals with cigarette smoke.

71-0752. Farias Rodriguez, J. M. **Carcinoma de Laringe. [Carcinoma of the Larynx.]** *Cirugia y Cirujanos* 39(2):823-844, March-April 1971, Spanish.

In this 19-year study, 149 cases of laryngeal carcinoma were examined. Of this total, 131 were men and 18 were women. Only twelve were nonsmokers. More than 90 percent of the patients were heavy smokers consuming one or more packs per day and most of them had started smoking before 15 years of age. All cases were epidermoid carcinoma and 80 were in advanced stages (III and IV). Radiotherapy and radical surgical treatment were considered the ideal form of treatment. The overall survival rate was 39.8 percent. A 3-year period free from tumorous activity after treatment was considered as a cure. All recurrences were seen within this critical three-year period.

71-0753. Greenblatt, M., Mirvish, S., So, B. T. **Nitrosamine Studies: Induction of Lung Adenomas by Concurrent Administration of Sodium Nitrile and Secondary Amines in Swiss Mice.** *Journal of the National Cancer Institute* 46(5):1029-1034, May 1971.

Piperazine (6.25 g/kg of food), morpholine (6.33 g/kg of food), and N-methylaniline (1.95 g/kg of food) given together with sodium nitrite (1.0 g/liter of drinking water) to Swiss mice resulted in a highly significant increase in lung adenoma incidence. This increase was more pronounced in males than in females. Dimethylamine hydrochloride (5.9 g/kg of food) was ineffective when given with nitrite, probably because of the strong basicity of the amine. Dinitrosopiperazine given as a 40 mg/liter solution in the drinking water, nitrosomorpholine (80 mg/liter), dimethylnitrosamine (10 mg/liter), and N-nitroso-N-methylaniline (70 mg/liter) increased the number of lung adenomas per mouse tenfold to thirtyfold over control untreated mice. Treatment with sodium nitrite alone or with the secondary amines alone produced no effect. The data strongly suggest that the induction of lung adenomas in animals treated with these secondary amines and nitrite is due to *in vivo* nitrosation (presumably in the stomach) with the formation of carcinogenic nitrosamines. (Auth. Abs.)

71-0754. Greisen, O. **The Bronchial Epithelium. Nucleic Acid Content in Morphologically Normal, Metaplastic and Neoplastic Bronchial Mucosae. A Microspectrophotometric Study of Biopsy Material.** *Acta Oto-Laryngologica* (Supplementum 276):1-110, 1971.

Chapter 1 surveys the chemistry, localization and function of nucleic acids. Chapter 2 describes the series of bronchial biopsy specimens, fixation, RNase treatment and staining of the sections, and also of photometric measurements of the nuclear and cytoplasmic nucleic acid content of epithelial tissue. Chapter 3 is concerned with the nucleic acid content in normal nuclei and the concentration of cytoplasmic RNA in various tissues. In the basal cells of morphologically normal bronchial epithelium, the nucleic acid content was measured in nuclei and cytoplasm. No correlation was found between the nucleic acid content and the ages of the patients, diagnosis or smoking habits. Methods for determining the mitotic activity are reviewed in Chapter 4. Chapter 5 describes the histological structure of the metaplastic alterations in the bronchial epithelium. The pathological anatomy of the bronchial adenoma and of the nucleic acid content and chromosome constitution in benign tumors are surveyed in Chapter 6. The classification of the bronchogenic carcinomata and factors responsible for the prognosis are mentioned in Chapter 7. The DNA content and the chromosomes of tumor cells are also discussed along with the formation and significance of the polyploid cell nuclei.

71-0755. Rokicki, W. **W Sprawie Zwiazku Miedzy Technologia Wyrobow Tytoniowych a Zapadalnoscia na Raka Pluc. [Connection Between the Technology of Tobacco Products and the Incidence of Pulmonary Cancer.]** *Przglad Lekarski* 29(4):311-313, 1971, Polish.

The problem of the rising incidence of lung cancer in communities with a high consumption of tobacco products is discussed on the basis of the literature and information from the World Health Organization. Differences in the coefficient of mortality from lung cancer in various countries applying different techniques in tobacco manufacture are given. The greater danger of cigarette smoking, especially of cigarettes made from tobacco prepared by the American "redrying" technique is mentioned. The reduced hazards of tobacco prepared by the natural process of enzymatic fermentation is pointed out.

71-0756. Schepers, G.W.H. **Lung Tumors of Primates and Rodents.** *Industrial Medicine and Surgery* 40(1):48-53, April 1971.

The materials reviewed include 269 industrially induced human lung cancers and 276 pulmonary neoplasmata, which developed in monkeys, rabbits, guinea pigs and rats after inhalation exposure or intratracheal injection of 266 chemical substances. The animal tumors developed in 10,768 experimental subjects, whereas 4,143 control animals, matched for sex, age and survival, showed no tumors. In addition to neoplasia, there were large numbers of lesions that were judged to be pre-neoplastic. The morphology of the animal tumors is compared with that of human tumors and some homologies were identified. A tentative explanation of the histogenesis of morphological varieties of animal tumors is offered. (Auth. Abs.)

71-0757. Sterling, T. D. **Smoking and Cancer. (Letter)** *Nature* 231(5304):543, June 25, 1971.

Dr. Cuyler Hammond's studies dealing with smoking and lung cancer are criticized for the methods by which the data were obtained and analyzed. There is a possibility that the association between smoking and lung cancer is a spurious by-product of biased sampling methods and that this relationship may actually be an expression of occupational exposures hidden within the data and not brought out by adequate analysis. There is also a claim that Hammond, in some instances in testifying before Congress, has used conclusions based on apparently distorted data summaries and has refused to make his data available for public review.

71-0758. Trethewie, E. R. **Effect of Low Temperature of Combustion on Cigarette Smoke Damage to Lung.** *Medical Journal of Australia* 1(16):854-856, April 17, 1971.

The effects of the smoke from two types of cigarettes on the lungs of Swiss white mice were compared. The cigarettes differed in average plateau temperature of combustion: 731°C for the manufactured cigarettes and 625°C for the special low-temperature cigarette. Carcinoma of the lung was produced in two of 18 mice exposed to the smoke of manufactured cigarettes, but in none of 29 mice exposed to the low-temperature cigarette or in 75 unexposed mice.

71-0759. Wynder, E. L., Mabuchi, K., Whitmore, W. F. (Jr.). **Epidemiology of Cancer of the Prostate.** *Cancer* 28(2):344-360, August 1971.

This study of the epidemiology of cancer of the prostate was based on a retrospective investigation of 300 patients with cancer of the prostate and 400 controls, a review of the charts of an additional 350 patient with prostate cancer, and a review of the literature. The main etiologic lead to which this study could not contribute is the rarity of clinical prostatic cancer in Japan and its increase among Japanese immigrants in the U.S. However, the low rate among Jewish males in the U.S. seems to be related to a lower rate of prostatic cancer among immigrants from Eastern Europe. U.S. Negroes have a higher incidence rate than Caucasians. No significant relationship was found to socioeconomic status, marital status, fertility, social habits, previous diseases, weight, height, hair distribution, or laboratory data. Tobacco and alcohol habits of prostatic cancer patients were similar to those of the controls. (Auth. Abs. Mod.)

See also, **71-0739, 71-0741**

NON–NEOPLASTIC RESPIRATORY DISEASES

71-0760. Anderson, W. H., Lane, E., Inglis, W. **Clinical Aspects of the Dyspneic Miner.** In: *Papers and Proceedings of the National Conference on Medicine and the Federal Coal Mine Health and Safety Act of 1969, Public Law 91-173.* University of California, Berkeley, School of Public Health and Howard University College of Medicine, Washington, D.C., June 15-18, 1970, (n.p.), 1970, 148-159.

An attempt was made to compare and determine the disabling disease in 400 Kentucky males complaining of dyspnea who had applied for old age survivors insurance (OASI) disability benefits and 300 Kentucky coal miners with a similar complaint. This study also sought to determine if coal dust inhalation by the miner leads to premature disability, heart disease and obstructive airway disease in addition to pneumoconiosis, and to determine to what extent the provisions of the Federal Coal Mine Health and Safety Act of 1969 would apply to the dyspneic miner. Both groups were found to have the same dyspnea-causing disabling diseases. The prevalence of chronic obstructive lung disease was higher in the OASI group than in the miner group. Arteriosclerotic heart disease (ASHD) was the single most frequent disabling disease in the miners. Disabled miners were significantly older than disabled OASI applicants. A correlation between cigarette smoking and chronic obstructive lung disease was found in the miners, but there was no correlation between smoking and ASHD or pneumoconiosis. There was no evidence that coal miners suffer premature disability and a greater prevalence of disabling heart and lung disease because of coal dust inhalation. In a randomly selected group of 500 dyspneic miners, only 65 or 13 percent met the criteria of the federal disability awards. Of these 65, 23 met the criteria by reason of pneumoconiosis alone, the remainder because of obstructive lung disease or cardiovascular diseases concomitant with, but unrelated to, simple pneumoconiosis. The Federal Coal Mine Health and Safety Act of 1969 was found not to confine disability payments to those disabled from pneumoconiosis alone, not to provide payments to all individuals disabled because of pneumoconiosis, and not to give awards to all disabled miners.

71-0761. Glauser, M.-P. **Le Deficit en Alpha$_1$-Antitrypsine, Associe a l'Emphyseme Pulmonaire. Contribution a l'Etude du Type Clinique des Malades. [Alpha$_1$-Antitrypsin Deficiency Associated With Pulmonary Emphysema. A Contribution to the Study of the Clinical Types of Patients.]** *Schweizerische Medizinische Wochenschrift* 101(26):949-954, July 3, 1971, French.

An attempt has been made to demonstrate alpha$_1$-antitrypsin deficiency in a group of patients with chronic obstructive lung disease. The deficiency was found in 11.3 percent of patients aged 50 years or under and was not found in patients aged over 50 years. On the basis of clinical, radiological, gasometric and functional data it could be concluded that in 6 of the 7 patients with the deficiency the emphysema was of the destructive type. Alpha$_1$-antitrypsin-deficient heterozygotes appear to be more common among emphysema patients than in the normal population. This fact, together with other considerations, suggests that another factor, associated with alpha$_1$-antitrypsin deficiency or otherwise, may be at the origin of the pulmonary parenchyma destruction. (Auth. Abs.)

71-0762. Glauser, M.-P. **Le Deficit en Alpha$_1$-Antitrypsine, Associe a l'Emphyseme Pulmonaire. Contribution a l'Etude du Type Clinique des Malades. (Fin). [Alpha$_1$-Antitrypsin Deficiency Associated With Pulmonary Emphysema. A Contribution to the Study of the Clinical Types of Patients. (Conclusion).]** *Schweizerische Medizinische Wochenschrift* 101(27):999-1003, July 10, 1971, French.

In a discussion of the observations presented in a previously-published portion of this study, two clinical types of emphysema patients are described. Results are compared with those from other studies on alpha$_1$-antitrypsin deficiency and its association with chronic bronchopulmonary diseases, especially emphysema.

71-0763. Golli, V., Stefanin, E., Stan, R., Turnescu, B. **Etude sur la Prevalence Actuelle de la Bronchite Chronique Dans une Population Urbaine. [Study of Current Prevalence of Chronic Bronchitis in an Urban Population.]** *Acta Tuberculosea et Pneumologica Belgica* 60(5):714-725, September-October, 1969, French.

A standard questionnaire survey of 2,942 persons ages 15 and over, of both sexes, of all professions, and living in Craiova was undertaken to study the incidence of chronic bronchitis in an urban population. The frequency of the disease increased progressively with age, from 1.05 percent for those below 20 years of age to 15.43 percent for those over 50 years of age. The disease was predominant in males, and although the difference in frequency was minimal in young subjects, a maximum was reached after 40 years of age when four men to one woman suffered from chronic bronchitis. After this age, the difference diminished so that the proportion between the sexes became 2:1, male to female. Previous respiratory ailments, particularly those which were recurrent, favored the disease. Tobacco was found to produce a decisive influence: the risk was six times greater in smokers than in nonsmokers. This risk was found to vary according to age. Up to 40 years of age, tobacco clearly and exclusively predominated as a risk factor, it being 10 times greater for smokers than for nonsmokers. After this age, although the frequency of the syndrome increased greatly in smokers, the risk also increased in nonsmokers. An extended duration of the smoking habit and the total quantity of cigarettes smoked (if higher than 200,000 cigarettes) increased the incidence of chronic bronchitis.

71-0764. Hyatt, R. E. **Pulmonary Function in Coal Workers' Pneumoconiosis.** In: *Papers and Proceedings of the National Conference on Medicine and the Federal Coal Mine Health and Safety Act of 1969, Public Law 91-173.* University of California, Berkeley, School of Public Health and Howard University College of Medicine, Washington, D.C., June 15-18, 1970, (n.p.), 1970, 121-138.

The results of a study on the prevalence of pneumoconiosis in coal miners in West Virginia are reviewed. In the sample of 267 men, approximately half had some roentgenographic category of pneumoconiosis and 7 percent had some progressive massive fibrosis. The prevalence of six symptoms–cough, phlegm, wheeze, aggravation of symptoms by adverse weather, episodes of increased cough and phlegm and dyspnea–were related to years spent underground. The increased prevalence of these symptoms could not be attributed to differences in age or smoking history, as the less than one-year underground group had a high cigarette consumption. The individual symptoms were associated with a decrease in pulmonary function, particularly increased airway obstruction as reflected in the maximal mid-expiratory flow (MMF). An important relationship was found between years spent underground and MMF for various age, smoking and roentgenologic groups. At virtually every smoking level, an increase in years underground was associated with a fall in MMF. Various methods used to measure the obstructive element in lungs, including spirometry, forced expiratory flow rates and resistance measurements, are described.

71-0765. Michie, I. **Lung Function in the Elderly.** *Gerontologia Clinica* 13:125-133, 1971.

Two hundred men, all over 60 years (mean age 75.5 years) had their ventilatory function tested. Lung function decreased with age, increasing grade of dyspnea and with decrease in chest expansion but there was no correlation between past or present smoking habit and ventilatory function. There was improvement in lung function in summer in patients who were assessed seasonally, even when the patients who had had chest infection were excluded. Nine of the 200 men had a pCO_2 level greater than 49 mm Hg and thus were in respiratory failure and in none of them was this suspected clinically. (Auth. Abs.)

71-0766. Possner, W. **Betrachtungen und Ergebnisse zur Epidemiologie nichtspezifischer Erkrankungen der Atemwege. [Observation and Results of the Epidemiology of Nonspecific Respiratory Disorders.]** *Zeitschrift fur die*

Gesamte Hygiene und Ihre Grenzgebiete 16(7):545-552, July 1970, German.

The importance of general and individual air pollution has been demonstrated in a study of 1191 workers of a chemical factory exposed to irritant gases and dusts. Analysis of the incidence of the symptoms of the diseases of the respiratory tract was of informative value for predicting the ventilatory behavior of the workers. Here as well as with chronic bronchitis, attention was paid to the correlation with factory-induced impairment of health. The importance of the individual smoking habit was demonstrated. Very few male nonsmokers below 40 years of age had dyspneic complaints in comparison with the female group. Past the age of 40, female smokers and nonsmokers occasionally had more frequent dyspneic complaints than the males.

71-0767. Reintjes, M., Bogaard, J. **De Invloed van het Roken van een Sigaret op de Longfunctie. [The Influence of Smoking a Cigarette on Lung Function.]** *Nederlands Tijdschrift voor Geneeskunde* 115(21):940-942, May 22, 1971, Dutch.

Thirty males (15 smokers, 15 nonsmokers) 19 to 28 years, all healthy except for pulmonary complaints, were tested directly after smoking one cigarette, and 15 minutes, 30 minutes, and one hour later. The Godard pulmotest and the Jaeger whole-body plethythsmograph were used in the tests. Values for VC and FEV are given. Statistical evaluation with the plethythsmograph showed a very significant difference between the values at the different points of time, the highest being immediately after smoking the cigarette. The course of time in the two groups were comparable and the difference in levels between smokers and nonsmokers was not significant. Statistical analysis of the spirographic results revealed that on the average the course of time in the two groups differed. There was no difference in the levels between smokers and nonsmokers and no difference in values at the different points of time.

71-0768. Sellick, H., Widdicombe, J. G. **Stimulation of Lung Irritant Receptors by Cigarette Smoke, Carbon Dust, and Histamine Aerosol.** *Journal of Applied Physiology* 31(1):15-19, July 1971.

Action potentials from single vagal nerve fibers from lung irritant receptors were recorded in bilaterally vagotomized rabbits. The receptors were stimulated when the rabbits inhaled cigarette smoke, "inert" carbon dust, and a 5-percent solution of histamine acid phosphate. Since these three aerosols cause vagal reflex hyperpnea and vagal reflex bronchoconstriction in man and other experimental animals, and since previously published work indicates that these are the reflex responses of stimulation of lung irritant receptors, it was concluded that the irritant aerosols used produce their reflex responses by stimulation of lung irritant receptors. They may cause or contribute to the breathlessness sometimes associated with their conditions. (Auth. Abs. Mod.)

71-0769. Signer, M. **Zur Pathogenese und Klinik der Infektionen der unteren Luftwege. (1. Teil). [Pathogenesis and Clinical Aspects of Infections of the Lower Respiratory Tract. (Part 1).]** *Praxis* 60(7):198-207, February 16, 1971, German.

A total of 91 men and 55 women who were treated at a Zurich hospital in 1966 are arranged by age and sex in the following categories: acute bronchitics, chronic bronchitics, bacterial pneumonias, atypical pneumonias, and pleurisy patients without detectable pneumonic infiltrate. Included are the results of sputum and X-ray analyses, accompanying illnesses, resistance to antibiotics, and the results of therapy. The smoking and drinking habits of the patients are detailed.

71-0770. Stuart-Harris, C. **Infection, the Environment and Chronic Bronchitis.** *Journal of the Royal College of Physicians of London* 5(4):351-360, July 1971.

In Britain, cigarette smoking, air pollution and the circumstances of life in industrial communities are thought to be the principal causes of chronic bronchitis. In other European countries and the U.S., cigarette smoking has also been recognized as a primary factor, but the role of air pollutants has been more difficult to determine. Infection, by bacteria and viruses, is known to have a considerable effect on the progress of airways diseases and its role in relation to chronic bronchitis and its associated physiological abnormalities is examined. Bacterial infection of the lower respiratory tract is a definite accompaniment of chronic bronchitis and is particularly obvious during exacerbations of illness. Viruses are found only transiently in the upper respiratory tract except for herpes virus and certain adenoviruses that persist in a latent fashion. Respiratory viruses can cause cell damage and necrosis in the respiratory epithelium and occasionally a particular viral infection, such as an attack of influenza, may play a primary role in initiating chronic bronchitis. Mycoplasms, other than *Micrococcus pneumoniae*, have rarely been found to be the cause of human respiratory illness. In a seven-year study of healthy men and of others with symptoms of early chronic bronchitis among transport workers in London, forced expiratory volume (FEV) showed an overall rate of decline. The frequency of chest illness, the frequency of production of purulent specimens and the presence of antibodies to *Hemophilis influenzae* were unrelated to the rate of FEV decline. There was no clear evidence that recurrent infection played a part in the development of airways obstruction. However morning sputum volume was related to the rate of decline as was cigarette smoking. Nonsmokers had the lowest and cigarette smokers had the highest rate of decline. Chest illnesses showed an increased frequency in smokers and in those with sputum. Almost nothing is known about the relation of infection to the genesis and progression of emphysema.

71-0771. Tarkoff, M. P., Kueppers, F., Miller, W. F. **Pulmonary Emphysema and Alpha$_1$-Antitrypsin Deficiency.** *American Journal of Medicine* 45(2):220-228, August 1968.

A genetically determined deficiency of alpha$_1$-antitrypsin has been shown to be associated with pulmonary emphysema. This deficiency is transmitted by a single gene. Heterozygotes for the deficiency gene have intermediate levels of alpha$_1$-antitrypsin, homozygotes have low levels. Of twelve patients with evidence of destructive lung disease present prior to age forty, two were found to be homozygous and one heterozygous for the alpha$_1$-antitrypsin deficiency gene. Clinical deterioration in our patients was rapid and associated with a respiratory tract infection. A deficiency of alpha$_1$-antitrypsin may be an important etiologic factor in the development of destructive lung disease occurring at a relatively young age. The rapid deterioration observed in our patients may be related to this deficiency. All twelve patients were heavy smokers, using more than one pack of cigarettes per day for ten or more years. (Auth. Abs. Mod.)

71-0772. Worth, G., Muysers, K., Smidt, U., Gasthaus, L. **The Epidemiology of Bronchopulmonary Symptoms in Coal Miners, Foundry Workers, Chemical Workers and Bakers.** *Bulletin de Physio-Pathologie Respiratoire* 6:617-636, 1970.

The results of epidemiological studies of bronchopulmonary symptoms are tabulated and discussed for the following groups: 1) 1886 coal miners with and without different grades of silicosis in comparison to 240 unexposed workers; 2) 720 coal miners with an increased residual volume; 3) 638 workers with and without bronchitis or bronchitic syndrome and different types of industrial exposure (chemistry, coal mines, bakery); and 4) 316 smelters and furnace bricklayers from a foundry. In Group 1, mean values for residual volume and for functional residual capacity were generally higher and for forced expiratory volume and vital capacity were lower in coal miners than in unexposed workers. Smoking habits and hardness of physical work were not different for the groups so that differences in lung function parameters could not be explained by factors other than occupation. Differences in values for other lung function parameters are discussed. In Group 2, the frequency of positive X-ray diagnosis of emphysema increased with higher residual volumes. In Group 3, the results suggest that these disturbances could be detected by lung function tests earlier than by conventional clinical methods or anamnestic data. In Group 4, the results showed that age had the main influence on phlegm, dyspnea, vital capacity, forced expiratory volume, arterial oxygen pressure, airway resistance and the slope of expiratory argon curves. Tobacco consumption showed an important effect on cough, arterial oxygen pressure and the slope of expiratory argon curves. Dust and heat exposure was related to cough and phlegm, but much less than to the measured values of lung function.

See also, **71-0720, 71-0739, 71-0754**

CARDIOVASCULAR DISEASES

71-0773. Abel, H., Schonberger, W., Schimmer, G. **The Size of the Spatial T-Area Vectors Under Conditions of Hypoxia.** Complete English translation of "Die Grosse der raumlichen T-Flachenvektoren unter Hypoxiebedingungen," *Zeitschrift fur Kreislaufforschung* 59(7):599-604, July 1970.

See Abstract 71-0105.

71-0774. Agnese, G., Canepa, R., La Rocca, M. **Eta e Valore di Alcuni Indici per la Discriminazione fra Soggetti Normali ed Ischemici. [Age and Value of Several Indices for Discrimination in Normal and Ischemic Subjects.]** *Giornale di Igiene e Medicina Preventiva* 11(3):140-151, July-September 1970, Italian.

A total of 530 subjects, half of whom were suffering from myocardial ischemia, were grouped into four age classes (20-39, 40-49, 50-59, 60-69). Overweight, systolic and diastolic blood pressures, skinfold thickness, cholesterolemia, beta-lipoproteinema and cigarette consumption were measured and recorded. The discriminant functions between normal and ischemic subjects, obtained on the basis of the afore-mentioned variables in the various age classes, were found to be unequally efficient (from 13 to 25 percent classification error) when related to the age of the subjects, in spite of the fact that the variables each had a different "discriminant weight" in each single age class. In older subjects (over age 50), beta-lipoproteinemia, and to a lesser degree systolic blood pressure, contributed to discrimination. In subjects under age 50, cholesterolemia and cigarette consumption were the main contributors to discrimination. In the youngest subjects (under age 40), cigarette consumption was by far the most important variable followed by cholesterolemia and overweight, the latter significantly contributing to discrimination in this age class only. The practical consequence of these observations is that with persons of a different age, different discriminating criteria must be used.

71-0775. Astrup, P., Kjeldsen, K., Siggaard-Andersen, J. **Carbon-Monoxide-Induced Mountain Sickness Provoked by Tobacco Smoking.** *Lancet* 1(7703):781-782, April 17, 1971.

A patient is described who, for many years, had had attacks of headache, vertigo, muzziness, and, occasionally, loss of consciousness. The attacks were always triggered off by intensive cigarette smoking. Similar symptoms were provoked by breathing carbon monoxide in air. Capillary filtration-rate and transvascular albumin transport also rose during laboratory exposure to carbon monoxide. The patient stopped smoking three years ago and has since been free from attacks. It is concluded that the attacks were caused by uptake of carbon monoxide from the tobacco smoke, the pathogenesis being increased endothelial filtration and permeability. (Auth. Abs.)

71-0776. Brown, J., Bourke, G. J., Gearty, G. F., Finnegan, A., Hill, M., Heffernan-Fox, F. C., Fitzgerald, D. E., Kennedy, J., Childers, R. W., Jessop, W.J.E., Trulson, M. F., Latham, M. C., Cronin, S., McCann, M. B., Clancy, R. E., Gore, J., Stoudt, H. W., Hegsted, D. M., Stare, F. J. **Nutritional and Epidemiologic Factors Related to Heart Disease.** *World Review of Nutrition and Dietetics* 12:1-42, 1970.

There is a higher mortality rate from arteriosclerotic heart disease in Massachusetts than in Ireland. A comparative epidemiological study of possibly related factors was made using 1994 middle-aged men, including over 500 pairs of brothers, one of whom lives in Ireland and the other in Boston. The intake of calories, complex carbohydrates, magnesium and fluoride (from tea) was higher in Ireland. The proportion of calories derived from fat and saturated fat, the serum cholesterol, the blood pressure levels and the amount of cigarette smoking did not differ markedly. The weight, skinfold thickness and number of abnormal electrocardiograms were higher in the Boston subjects. A study of the pathology of coronaries and aortas from autopsies revealed much earlier serious atheromatous involvement in the Boston than in the Irish specimens. Increased physical activity appears to be important in reducing the risk of coronary heart disease in Ireland. (Auth. Abs.)

71-0777. Estandia Cano, A., Esquivel Avila, J., Malo Camacho, R., Ferez Santander, S., Leon Montanez, E. **Infarto Juvenil del Miocardio. [Myocardial Infarction in the Younger Age Groups.]** *Archivos del Instituto de Cardiologia de Mexico* 41(2):137-150, March-April 1971, Spanish.

Sixteen years of clinical material were reviewed in order to determine if the incidence of myocardial infarction in subjects under 40 years of age has increased. Although this fact was confirmed from the data, the increase is not significant because it parallels the incidence of myocardial infarction for all ages, and in general, of arterioslerosis cardiopathy. Results are presented from a study of a group of 84 cases of myocardial infarction in subjects 39 years of age or under. Clinical aspects of this group which could indicate predisposing factors to myocardial infarction in young people as compared to those in older people were investigated. The significant factors found were: minimal physical activity, intense or moderate intellectual activity, major emotional tension, and heavy smoking habit. Incidence in males predominated. Family history was significant regarding diabetes mellitus and arteriosclerosis cardiopathy; in these cases precordial pain in the acute stage of longer duration and greater severity is more frequent. Cardiogenic 'shock' was also more common in young persons. However, there were no observed differences in mortality.

71-0778. Kannel, W. B., Garcia, M. J., McNamara, P. M., Pearson, G. **Serum Lipid Precursors of Coronary Heart Disease.** *Human Pathology* 2(1):129-151, March 1971.

If a substantial reduction in coronary mortality is to be achieved, vulnerable persons will have to be detected and placed under continued surveillance and prophylactic management. The background of the potential coronary candidate has been delineated and a profile capable of estimating risk over a wide range devised. One of the most potent contributors to this profile is the serum lipid value. Although any lipid or lipoprotein can be used, none is more convenient than or superior to a simple total cholesterol determination. For determining the nature of the lipid disorder and choosing the most appropriate therapy, a lipid profile is most useful. Therapy is definitely indicated in moderate hypercholesterolemias (in the range of 250 to 350 mg per 100 ml), particularly when associated with other abnormalities such as hypertension, electrocardiographic evidence of left ventricular hypertrophy, or diabetes. Even though asymptomatic, such persons are extremely vulnerable to lethal coronary attacks. These findings must not be regarded as medical trivia. If the physician accepts the challenge to seek out and cope with coronary precursors, the clinical pathologist will be called on increasingly to perform lipid assessments in asymptomatic persons and to provide expert consultative assistance in interpreting the lipid findings. (Auth. Abs.)

71-0779. Keys, A., Taylor, H. L., Blackburn, H., Brozek, J., Anderson, J. T., Simonson, E. **Mortality and Coronary Heart Disease Among Men Studied for 23 years.** *Archives of Internal Medicine* 128(2):201-214, August 1971.

Twenty-year coronary heart disease (CHD) incidence is analyzed for 279 men, CHD-free at the ages of 47 through 57 years and characterized by three examinations before 20 annual follow-up examinations. Sixty men developed CHD, 42 dying or suffering infarction. Among 20 entry characteristics, three had major predictive power, especially for CHD death or infarction: cold pressor test, a high level of serum cholesterol and systolic blood pressure. Smoking and relative weight seemed unimportant. Major CHD incidence was proportional to cholesterol to the 3.4 power. Five-variable multiple logistic analysis permitted placement of men into deciles of estimated risk differing more than tenfold in CHD incidence. The combination of only cholesterol and systolic pressure was nearly as good. The multiple logistic coefficients applied to five-year data on 1,287 men among whom 182 CHD developed in 182 yielded satisfactory agreement between observed and predicted distributions of CHD cases in classes of estimated risk. (Auth. Abs.)

71-0780. Knappe, J., Erbstosser, H., Strube, G., Knappe, G., Duck, K.-D. **Gezielte Pravention bei der ischamischen Herzkrankheit in Rahman einer experimentellen epidemiologischen Studie. [Directed Prevention of Ischemic Heart Disease in the Framework of an Experimental Epidemiological Study.]** *Deutsche Gesundheitswesen* 26(15):678-681, April 8, 1971, German.

Within an experimental epidemiological longitudinal study, the possibilities of a directed prevention of ischemic heart disease by exerting a direct and an indirect influence upon its so-called risk factors are examined. An epidemiological cardiac-circulatory examination applying the examination methods recommended by the World Health Organization is first carried out. The selection of subjects suffering from ischemic heart disease, as well as of the control group, and the detection of the presence of the so-called risk factors within this group, including statistical checks for significant correlations are carried out by means of a storage-programmed digital calculator. Among the several risk factors studied are genetic factors, elevated serum lipids, obesity, heavy smoking habits, and pathological drop in glucose tolerance. Subjects manifesting clinical and, above all, subclinical symptoms of ischemic heart disease as well as patients endangered by cardiac infarction are subjected to an individual program of health education and therapy corresponding to the risk factors detected. This program is mainly based on dietetic guidance, a circulation-promoting physical training, and psychotherapeutic measures during a four- to six-week hospital treatment in a ward specializing in preventive and rehabilitative cardiology.

71-0781. Prior, I.A.M., Evans, J. G. **Current Developments in the Pacific.** In: Jones, R. J. (Editor). *Atherosclerosis: Proceedings of the Second International Symposium.* Chicago, November 2-5, 1969. New York, Springer-Verlag, 1970, pp. 335-342.

Highlights of various studies being conducted throughout the Pacific dealing with coronary heart disease risk factors, such as weight, blood pressure, cholesterol and smoking, and their distribution among the scattered populations are presented.

71-0782. Ryvkin, I. A. **Faktory Riska i Pervichnaya Profilaktika Arterial'noy Gipertonii i Ischemicheskoy Bolezni Serdtsa. [Risk Factors and Primary Prevention of Arterial Hypertension and Ischemic Heart Disease.]** *Kardiologiia* 11(1):140-151, January 1971, Russian.

Factors promoting the development of arteriosclerosis and ischemic heart disease appear to be the disruption of lipid and carbohydrate metabolism, arterial hypertension and smoking. In recent years the importance of a hereditary predisposition and obesity has also been established. Insufficient physical activity and systematic nervous-psychic stress also further the development of atherosclerosis and ischemic heart disease, but these factors require further study. Continued observation of the application of a hypercholesteremic diet and hypotensive preparations appear to prevent the development of these diseases, especially when application is begun when the individuals are in the younger years. Prophylaxis of arterial hypertension requires treatment of diseases of the kidneys and urinary system. The solution to problems of prophylaxis of hypertensive diseases and ischemic heart disease lies in modifications in living conditions, particularly towards a rational nutrition with lowering of general caloric intake and of animal fats, a light intake of carbohydrates and possibly salt, a rational combination of mental work with physical activity, and a renunciation of smoking.

71-0783. Shappell, S. D., Murray, J. A., Nasser, M. G., Wills, R. E., Torrance, J. D., Lenfant, C.J.M. **Acute Change in Hemoglobin Affinity for Oxygen During Angina Pectoris.** *New England Journal of Medicine* 282(22):1219-1224, May 28, 1970.

The hypothesis that a decrease in hemoglobin affinity for oxygen is a compensory mechanism to increase oxygen delivery to ischemic myocardium was tested in six patients with angina pectoris. Blood was drawn simultaneously from radial artery and coronary sinus. Oxygen tension at 50 percent saturation (P_{50}) and erythrocytic 2,3-diphosphoglycerate, adenosine triphosphate and pH measured before, during and after angina pectoris produced by atrial pacing showed no significant difference at rest. The longer the duration of angina pectoris, the more coronary-sinus P_{50} exceeded arterial P_{50}. After four to 10 minutes of angina, the difference was 0.6 to 2.9 mm of mercury. One patient, in whom ST-segment depression and lactate production but no angina pectoris developed, had no change in hemoglobin affinity for oxygen. Decreased hemoglobin affinity for oxygen was not accompanied by change in erythrocytic 2,3-diphosphoglycerate, adenosine triphosphate and pH. The rapid decrease in affinity enhances myocardial oxygen delivery during angina pectoris. (Auth. Abs.)

See also, **71-0760, 71-0787**

OTHER DISEASES AND CONDITIONS

71-0784. Ainley, R. G. **The Farnsworth-Munsell 100 Hue Test in Tobacco Amblyopia.** *Transactions of the Ophthalmological Societies of the United Kingdom* 90:765-772, 1970.

The Farnsworth-Munsell 100 hue test was administered to 15 males, ages 45 to 83, with tobacco amblyopia. All were pipe smokers except for a cigarette smoker (20 cigarettes per day) and one whose tobacco consumption was negligible. The latter turned out to be a vegetarian with a vitamin B_{12} deficiency and so was predisposed to amblyopia with a smaller tobacco consumption than usual. All were successfully treated with hydroxocobalamin and/or tobacco abstention. A control group showed that familiarity with the test had no effect on performance. In patients with tobacco amblyopia, the highest partial error scores are concentrated in the yellow-red and yellow region centered in hue 15, and in the blue and purple-blue region between hues 54 and 68, giving a bipolar shape to the color profile which persists during treatment. Apparently, in tobacco amblyopia color discrimination is the last visual function to recover and is probably the first to be affected. The 100 hue test may more easily detect tobacco amblyopia in its earlier stages than other tests and may provide valuable diagnostic evidence in patients whose central fields cannot be plotted reliably.

71-0785. Alp, M. H., Court, J. H., Grant, A. K. **Personality Pattern and Emotional Stress in the Genesis of Gastric Ulcer.** *Gut* 11(9):773-777, September 1970.

In a group of 181 persons with a past history of chronic gastric ulcer, a greatly increased incidence of domestic and financial stress has been found, when compared with age- and sex-matched persons with no previous history of gastric ulcer. The consumption of aspirin, alcohol and cigarettes was also significantly increased. Persons with chronic gastric ulcer were characterized by a personality pattern of independence and self-sufficiency, and they are prone to anxiety and depression. This pattern was three times more common in the ulcer group than in matched individuals without chronic gastric ulcer. It is possible that internal conflict between a genetic and an environmentally induced sex role, together with an inability to externalize aggression, may be significant factors in the causation of chronic gastric ulcer. (Auth. Abs.)

71-0786. Chisholm, I. A., Pettigrew, A. R. **Biochemical Observations in Toxic Optic Neuropathy.** *Transactions of the Ophthalmological Societies of the United Kingdom* 90:827-838, 1970.

Investigations into the complex metabolic interrelationships between cyanide and vitamin B_{12} in tobacco amblyopia are discussed. Tobacco amblyopia and Leber's hereditary optic atrophy are shown to be diseases in which a defect in the cyanide detoxication mechanisms is present. Hydroxocobalamin therapy facilitates the excertion of thiocyanate by a mechanism which is not yet clear but which may be sited in the kidney. Preliminary results in using oral cystine have also been encouraging.

71-0787. Dalderup, L. M., Van Haard, W. B., Zwartz, J. A., Keller, G.H.M., Drion, E. F., Schouten, F.J.M., Van Dam, B. E. **Serum Lipids and Energy Expenditure in Old Men.** *Voeding* 32(6):291-305, June 15, 1971.

Serum lipid patterns, diet and activity were studied in a group of 61 aged men (mean age 81 years). The men were found to have, on an average, low serum lipid levels similar to those of young adults, and low blood pressures. They had as much body fat as normal young women and ate what others ate as far as quality was concerned, but ate much less in quantity than younger and active men. Physical activity and smoking did not affect serum lipid levels to such an extent as in younger age groups, although smoking did affect the serum "large particle" fraction. The blood lipid pattern was influenced by a negative calorie balance resulting in consumption of own tissue for the daily calorie needs which is consistent with a simulated high fat/low carbohydrate diet. A new formula for the basal metabolic rate is given.

71-0788. Kulavskiy, V. A. **Kureniye i Beremenmost' (Obyor Literatury). [Smoking and Pregnancy (Review of the Literature).]** *Akusherstvo i Ginekologiia* 46(6):68-70, June 1970, Russian.

The literature survey lists the different effects of maternal smoking on the fetus and neonate including prematurity and low birth weight, asphyxiation and perinatal mortality, neonatal complications, poor appetite in pregnant women which can affect transplacental exchange, effect of carbon monoxide on oxygen transport in the fetus, and the teratogenic effect of carbon monoxide. Currentlv there is much interest not only in the transplacental effects of nicotine but its presence in the mother's milk. The negative effect of tobacco smoke and tobacco dust on workers in the tobacco industry and on the reproductive cycle of women are also under investigation.

71-0789. Luthra, U. K., Woods, D. A., Wahi, P. N., Gupta, M. **Ultrastructure of Human Oral Mucosa After Prolonged Exposure to Tobacco.** *Indian Journal of Medical Research* 59(1):157-162, January 1, 1971.

Detailed light and ultrastructure studies of human oral mucosa after prolonged exposure to tobacco are described. Distinctive ballooned cells in the epithelium were an important feature. These are described in detail. A most noticeable feature in tobacco treated mucosa was the development of a submicroscopic lesion at the epithelial-connective tissue junction. Structural similarity of this abnormality is discussed. (Auth. Abs.)

71-0790. Menges, R. W., Selby, L. A., Marienfeld, C. J., Aue, W. A., Greer, D. L. **A Tobacco Related Epidemic of Congenital Limb Deformities in Swine.** *Environmental Research* 3(4):285-302, 1970.

An epidemic of congenital limb deformities in swine is described. The epidemic occurred among 79 Duroc sows and gilts on a farm in Howard County, Missouri, during the period September 11, 1967, to March 3, 1968. The 79 females farrowed 782 pigs: 742 (95 percent) were born alive, 40 (5 percent) were born dead, and 59 (7.5 percent) were born with congenital abnormalities. The abnormal pigs were farrowed by 14 sows. These sows farrowed 149 pigs and 59 (40 percent) were abnormal. Tobacco stalks were placed in a swine lot and pasture between October 25, 1967, and December 7, 1967, and some of the sows were observed eating the stalks. On December 7, 1967, four sows had an illness which lasted 24-48 hours. The first 38 days of pregnancies in those sows with the affected progeny occurred during the time when the tobacco was available to them. Other animals not exposed to the tobacco stalks as a food source had no birth defects. The animals involved in the epidemic during prior and later reproductive periods had no abnormalities in their litters. The tobacco stalks, therefore, appeared to have some association with the epidemic. The tobacco stalks were tested for nitrate–nitrogen, pesticides, fungi, nicotine, and maleic hydrazide. The nitrate–nitrogen varied from 20 to 1390 ppm, and no significant amounts of aldrin, dieldrin, or *pp'*-DDT were found. The fungi consistently isolated included a species of *Penicillium* identified as a variant of *Penicillium cyclopium*. Other species of fungi were isolated only sporadically, and no *Aspergilli* were found. Nicotine, other alkaloids or components of the tobacco stalks, appeared to be the most likely cause of the epidemic. The tobacco stalks eaten by the swine contained 1058 ppm of nicotine and 115 ppm of maleic hydrazide. The possible relationship of this epidemic of birth defects in swine associated with the ingestion of tobacco stalks to the increased fetal loss described among smoking mothers is discussed. (Auth. Abs.)

71-0791. Plackova, A., Medak, H., Meyer, J., Waterhouse, J. P. **Ultrastructure of Surface Cells of the Oral Mucosa.** *Folia Morphologica* 19(2):165-170, 1971.

A method is described for the electron microscopic examination of smears taken from oral lesions. The method is applied to the determination of whether the demonstrable ultrastructural detail can be used to advantage to increase the diagnostic precision of exfoliative cytology. Smears and incisions or excision biopsies of normal human buccal mucosa and of tobacco-associated white lesions from the same region of the cheek were processed for electron microscopy. The subjects included two heavy cigarette smokers and four tobacco chewers, all of whom had been using tobacco for a long period (from 20 to 50 years).

71-0792. Roy, F. H., Kelly, M. L. **Chronic Maternal Cigaret Smoking and Infant Retrolental Fibroplasia: Negative Results.** *Annals of Ophthalmology* 3(7):693-694, July 1971.

Chronic maternal smoking may be a contributing factor in infant retrolental fibroplasia (RLF). The chronic and repeated fetal vasoconstriction of maternal smoking combined with fetal carbon monoxide buildup produces fetal anoxia. Retinal anoxia is thought to be a precipitating factor in RLF. It is hypothesized that RLF in smoking mothers can be produced with no oxygen greater than is necessary in nonsmoking mothers. A retrospective questionnaire study of 26 RLF patients of the Arkansas School for the Blind did not statistically support this hypothesis. Limitations of this current study and future studies are mentioned. (Auth. Abs.)

71-0793. Schott, L. **Vergleichswerte zur Frage der Beeinflussbarkeit des PTC-Schmeckvermogens durch Tabakgenuss. [Comparative Values on the Question of the Influence of Tobacco Consumption on the PTC-Taste Capability.]** *Biologische Rundschau* 7:261-263, 1969, German.

The findings of a number of investigators are summarized in a table, showing the distribution of the PTC (plasma thromboplastin component) nontasters in middle-European smokers and nonsmokers arranged by sex. No conclusive results could be obtained from a comparison of the chi^{2}s. Whether ethnic considerations might account for the discrepancies in the results await further research.

71-0794. Toporkova, I. B. **Vitamin C Balance in Connection With Chronic Exposure of Tobacco Industrial Workers to Tobacco Dust.** Complete English translation of "Sostoyaniye C-Vitaminnogo Obmena v Svyazi s Khronicheskim Vozdeystiviyem Tabachnoy Pyli u Rabochikh Tabachnoy Promyshlennosti", *Leningradskii Sanitarno-Gigiencheskii Meditsinskii Institut, Trudy* 47:243-253, 1959.

This study deals with the effect of tobacco dust on the vitamin-C balance in tobacco industrial workers. The determination of the saturation of the organism with vitamin C in workers who were examined was carried out by the R. S. Harris's big doze test and I. I. Matusis's modification. The vitamin C content in persons connected with the treatment of tobacco and in those of control groups was investigated in their usual working conditions as well as in a C-vitaminizing process. A person exposed to the effect of tobacco dust showed a significant vitamin C deficiency. To control this effect and to increase the resistence of the organism to the toxic influence of the nicotine in the tobacco dust, a prophylactic C-vitaminizing process should be carried out by daily administration of a 100-mg dose of vitamin C to each worker.

71-0795. Wilson, J., Matthews, D. **Recent Research in Some Optic Neuropathies.** *Transactions of the Ophthalmological Societies of the United Kingdom* 90:733-737, 1970.

In Leber's optic atrophy, both in smokers and nonsmokers, there is a substantial absolute increase in cyanocobalamin concentration in the plasma. Since this a parameter of cyanide metabolism not directly dependent on thiocyanate levels, it must be considered as confirmatory evidence of a disturbance of cyanide metabolism. This abnormality is not invariably present in all cases, and therefore is thought to be not a primary but a secondary metabolic derangement. In some patients with dominantly inherited optic atrophy, cyanocobalamin was present in very high concentrations. The difference in this respect between nonsmokers and smokers is as yet unexplained; it is noteworthy that most of the nonsmokers were children, whereas all the smokers were adults. This disease, which clinically resembles tobacco amblyopia, may also reflect an inborn error of cyanide metabolism. The possibility that Leber's disease is a maternally transmitted viral infection is discussed.

See also, **71-0735**

71-0796. Biener, K. **Die Jugend im Brennpunkt der Praventivmedizin. [Juveniles as the Focus of Preventive Medicine.]** *Deutsche Medizinische Wochenschrift* 96(20):879-883, May 14, 1971, German.

Many causes of disease are considered avoidable, especially those relating to poor living habits, the most important of which is the consumption of tobacco. The report discusses the rise in the consumption of tobacco in teenagers and pre-teenagers, their reasons for initiating the habit, as well as the effect of parental smoking or the attempt to dissuade their offspring from starting to smoke. Many of the young smokers could offer no concrete reason for starting to smoke but their non-smoking peers mentioned health reasons, including the fear of lung cancer, the desire to excel in sports or to save money. The consumption of alcohol and drugs is discussed in similar fashion. Other topics under consideration in the report dealt with death by accident or suicide, and the need for sports and health education programs to improve the health of the juveniles.

71-0797. Fiabane, L. **L'Abitudine al Fumo fra gli Studenti Delle Scuole Medie Bellunesi. [Smoking Habits Among Secondary School Students in Belluno.]** *Annali Della Sanita Pubblica* 31(4):509-521, July-August 1970, Italian.

A survey of secondary school students in Belluno, Italy, has shown that 62 percent of them are regular smokers. The age at which the smoking habit is formed is between the 15th and 16th year, for both boys and girls. Some social and individual habit-forming factors are discussed in view of setting up a health education program. (Auth. Abs. Mod.)

71-0798. Giese, H., Schmidt, G. **12. Personlichkeitsmerkmale. [12. Personality Characteristics.]** In: *Studenten-Sexualitat. Verhalten und Einstellung.* Reinbek, Germany, Rowohlt, 1968, pp. 345-381, German.

Statistics are presented in tables arranged by sex, concerning various forms of sexual behavior in terms of neuroticism, extraversion, religious conviction and church attendance, and the consumption of alcohol, coffee, sweets, and tobacco. A table correlates alcohol and tobacco consumption with religious training and church attendance. Another table shows the intercorrelation of the consumption of alcohol, coffee, sweets, and tobacco. The significance of the relationships are discussed in detail.

71-0799. Irgens-Jensen, O., Brun-Gulbrandsen, S. **Drugs in Norway–Attitudes and Use.** *International Journal of the Addictions* 6(1):109-118, March 1971.

A 1968 survey of 2000 adults to determine the effectiveness of a drug abuse campaign on the attitudes and use of drugs in Norway showed that 1.9 percent of the respondents admitted to having used cannabis, 97 percent had heard about the drug, 96 percent were in favor of legal restrictions and about 6 percent declared they would like to try cannabis if they could do so legally. The respondents rated the following drugs in descending order of their harmfulness: LSD, marijuana, morphine, amphetamines, alcohol, sleeping pills, tranquilizers, tobacco. The subjects also felt that smoking marijuana once a day for one month would be more likely to lead to dependence than would taking morphine daily for the same length of time, and far more so than smoking 5-10 cigarettes, taking sleeping pills, or drinking alcohol to the point of intoxication daily for one month. The survey indicated that the drug abuse campaign may have been too successful because of the tendency to view drugs, such as morphine and amphetamines, as being less dangerous than cannabis. Also a credibility gap may emerge between youth and the authorities if the former gain the impression that the authorities have presented as facts what in reality are personal opinions and unproved hypotheses about drugs. In a similar survey, Oslo students rated LSD as the most dangerous but ranked morphine second, amphetamines third and cannabis fourth. The long-term social effects on youth of severe penalties for relatively minor drug offenses are mentioned. The use of cannabis, as well as other drugs, among the youth of Norway is shown to be on a relatively small scale as compared with that in many other countries, notably Sweden and Denmark. This difference may be due to the fact that Norway is still not as urbanized as the other Scandinavian countries, that puritan traditions are still widespread and that Norway has pursued a much more restrictive policy in regard to cannabis and other drugs than either Sweden or Denmark.

71-0800. Jana, H. **Cardiovascular and Respiratory Changes in Suggested Smoking.** *Journal of the American Institute of Hypnosis* 12(3):143-146, July 1971.

Cardiovascular and respiratory responses were measured in a 24-year-old male after smoking two cigarettes and several days later after suggested cigarette smoking while in a hypnotic trance. Results showed that suggested smoking can bring about cardiovascular and respiratory responses similar to those from actually smoking cigarettes. There was an increase in blood pressure and heart rate, vasoconstriction and a depression of the rate of respiration. There was no evidence of metabolic change under either condition.

71-0801. Lapiccirella, V. **L'Omeostasi e la sua Probabile Alterazione da Limitazioni Alimentari e Voluttuarie, Alla Luce del Giudizio Clinico Psicosomatico. [Homeostasis and its Probable Alterations by Alimentary and Voluptuary Limitations in the Light of Clinical Psychosomatic Judgment.]** *Medicina Psicosomatica* 15(3/4):187-199, July-December 1970, Italian.

The initial clarification of the fundamental concept of "homeostasis" is followed by the consideration of the phenomenon from the practical point of view and by the analysis of such habits as the consumption of tobacco, alcohol and coffee, whose prohibition by the physician results when the pathological stage is manifested. The pharmacological effects of smoking are explained mainly in terms of the action of nicotine. The psychic action of smoking, however, is only partially reproducible by the administration of the pure alkaloid. With the illustration of the author's own concept of "balanced-unbalance," there is an emphasis on the dangers inherent in an absolute prohibition, which, by disruption of a vicious cycle having a physiopathological action, often results in an overt pathology.

71-0802. O'Keefe, M. T. **The Anti-Smoking Commercials: A Study of Television's Impact on Behavior.** *Public Opinion Quarterly* 35(2):242-248, 1971.

An investigation was made of students by questionnaire and of the general population by random telephone survey in the Central Florida area of Orlando to determine the effectiveness of the anti-cigarette smoking campaign launched on television in the late 1960's. Usable questionnaires for both groups totaled 921. Findings showed that 69.9 percent of the nonsmokers perceived the commercials as being effective while 52.3 percent of the smokers held this view. Nonsmokers were more likely to credit the campaign with getting smokers to stop, while smokers were more likely to believe that the commercials would have no effect. When smokers were asked whether the commercials had affected their personal smoking habits, 34 percent of the students and 29 percent of the general population said they had cut down, 34 percent of the students and 40 percent of the others said they thought more about the effects of smoking than before, and 22 percent of the students and none of the others said the commercials made them stop smoking temporarily. Those predisposed toward giving up smoking were much more likely to report that the commercials had affected their smoking habits. The commercials influenced a bare majority of the smokers who wanted to quit and only half of these reported that the commercials had helped them cut down. In addition, 42 percent of those who wanted to quit smoking reported that the commercials acted as an incentive to quit. Only 1 percent of the nonsmokers and ex-smokers credited the commercials with preventing them from smoking or helping them quit. In the general population, the commercials had their greatest effect on those who smoked the least, and little or no effect on heavy smokers. However, heavy smokers in the student sample were most likely to report the commercials' influence, while light smokers felt their behavior would cause few, if any, health problems. Smoking was held to be a health hazard by 63.1 percent of the student smokers and 72.7 percent of the general population, yet two-thirds of the sample did not change their smoking habits. Apparently the majority of smokers who feel that smoking is a health hazard also perceive an immediate reward from smoking and the threat of ill effects seems too far in the future or too intangible to cause them to alter their habits.

71-0803. Tornero Dias, C. **Simposio Sobre Problemas Medicos Originados por el Tabaquismo. V. Consideracions Psicologicas. [Symposium on Medical Problems Originating from Tobaccoism. V. Psychological Considerations.]** *Neumologia y Cirugia de Torax* 32(1):31-34, January-February 1971, Spanish.

People smoke because thay have the need to escape from reality. For smokers, reality is difficult to deal with and cannot be faced without the help of external agents which provide a sensation of alleviation and comfort. Smoking constitutes a release from tensions and the apparent control of emotions and affections.

GENERAL

71-0804. Corwin, E. **Smoking–A World Problem.** *HSMHA Health Reports* 86(6):501-506, June 1971.

Both England and the U.S., the countries which had the most to do with popularizing smoking, have become its leading opponents. In addition to their landmark scientific reports assessing world knowledge on smoking and health, both countries have initiated far-reaching control measures such as health warnings on cigarette packages, restrictions on cigarette advertising and increased funds for public education on the dangers of smoking. But other countries are faced with the dilemma of how to cope with the smoking and health problem, since tobacco is a source of revenue from state tobacco monopolies or from taxes, and it is also an important money crop. Some countries have taken certain control measures against cigarette smoking which antedate those taken in the U.S. and England. In the U.S., new bills have been introduced in State legislatures and Congress to restrict smoking in public places, to ban smoking at certain indoor sports events, to segregate smokers in large commercial aircraft and to provide protected areas for nonsmokers in public interstate carriers. Public sentiment seems to favor these actions. One reason why countries may be slow to adopt health warnings and other smoking control measures is that there is still skepticism about the dangers of smoking. This skepticism means that the publication of medical reports associating smoking with health hazards has not only failed to reduce cigarette consumption in developing countries, but has not caused any permanent decrease in cigarette consumption in developed countries. Several countries have already taken or are about to take action prohibiting or sharply restricting cigarette advertising, particularly over radio and television. While some countries have geared their educational programs on smoking toward youth, the U.S. has had more success in changing the smoking habits of adults. Recommendations for government action on the smoking and health problem are detailed.

71-0805. Igiene e Sanita Pubblica. **Campagna di Educazione Sanitaria Contra il Fumo de Tabacco Nel Comune di Bologna. [Educational Health Campaign Against Smoking in the Town of Bologna.]** *Igiene e Sanita Pubblica* 27(1-2):39-41, January-February 1971, Italian.

The antismoking campaign carried out by the Public Health Service in Bologna, Italy, is described. The program was directed primarily to schoolchildren so that the health hazards due to smoking could be explained to the young before a habit was established. Health educators participated in the health programs established in each school. A series of lectures by university professors and doctors was also offered in which the scientific, medical, and psychological aspects of the smoking habit were discussed.

CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-0806. Adams, J. D., Erickson, H. H., Stone, H. L. **The Effects of Carbon Monoxide on Coronary Hemodynamics and Left Ventricular Function in the Conscious Dog.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 107-110.

The effects of hypoxia induced by sub-clinical levels of carboxyhemoglobin (COHb) on the coronary hemodynamics and left ventricular function were measured in the conscious dog. The animals were exposed to CO–air mixtures containing either 1500 or 3000 ppm CO in room air for approximately 30 minutes on two separate occasions, 4-7 days apart. Five percent COHb caused a 14-percent increase in coronary flow, an 8-percent increase in coronary stroke volume and a 4-percent increase in heart rate above their control values; while 20 percent COHb resulted in a 14-percent increase in coronary flow, a 37-percent increase in coronary stroke volume and a 20-percent increase in heart rate. Left ventricular function was unaffected by increased levels of COHb. Possible mechanisms for these changes are discussed.

71-0807. Baribaud, L., Yacoub, M., Faure, J., Malinas, Y., Cau, G. **Presence of Carbon Monoxide in the Blood of a Child Born of a Smoking Mother.** Complete English translation of "L'Oxycarbonemie de l'Enfant Ne de Mere Fumeuse," *Medecine Legale et Dommage Corporel* 3(3):272-274, July-August-September 1970.

See Abstract 71-0006.

71-0808. Bautista O'Farrill, J. **Simposio Sobre Problemas Medicos Originados por el Tabaquismo. III. Efectos de la Nicotina y del Humo del Tabaco Sobre el Aparato Digestivo. [Symposium on Medical Problems Originating in Tobaccoism. III. Effects of Nicotine and Tobacco Smoke on the Digestive System.]** *Neumologia y Cirugia de Torax* 32(1):19-25, January-February 1971, Spanish.

The action of nicotine and tobacco smoke on the organs of the digestive system was studied from a pharmacological and physiological point of view. A possible relationship with various diseases and conditions is described. It is concluded that although there is no solid basis to affirm that such action is harmful, it is thought that patients with digestive diseases will benefit if they avoid all use of tobacco.

71-0809. Beard, R. R., Grandstaff, N. **Behavioral Responses to Small Doses of Carbon Monoxide.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 93-105.

Investigations on the effects of small doses of carbon monoxide (CO) on human cerebral function are reviewed. These studies tested the time-judgment function in response to visual or auditory stimuli during 30-90 minute exposures to CO concentrations ranging from 50-250 ppm. The results generally indicated that CO produces a dose-related impairment of this function. However, in a replication of a temporal discrimination test using visual in place of auditory stimuli, CO in concentrations up to 250 ppm had no apparent effect.

71-0810. Bock, F. G., Swain, A. P., Stedman, R. L. **Composition Studies on Tobacco. XLIV. Tumor-Promoting Activity of Subfractions of the Weak Acid Fraction of Cigarette Smoke Condensate.** *Journal of the National Cancer Institute* 47(2):429-436, August 1971.

Subfractions of the weak acid fraction of cigarette smoke condensate (CSC) were tested for tumorigenic activity in mice previously painted with 125 micrograms of 7,12-dimethylbenz(*a*)anthracene (DMBA). In one experiment, the pH of the test solutions ranged from 5.7–6.0. In a second experiment, the pH range was 5.0–5.5. Before fractionation the weak acids were more active in the second experiment with the lower pH. The residue remaining after steam distillation was consistently active. The steam distillates and a synthetic steam distillate gave inconsistent results and probably do not contribute importantly to the carcinogenicity of CSC for mouse skin. In high concentrations, the unfractionated weak acids produced 2 tumors in a group of 50 mice that had not been previously exposed to DMBA. The weak acid fraction is thus a very weak complete carcinogen. Even so, a comparison of the tumor yields produced by DMBA alone, by the weak acids alone, and by combinations of both agents suggests that the weak acids acted as promoting agents. It was concluded that the promoting activity of the weak acid fraction of CSC depended primarily on the nonvolatile constituents and only slightly on volatile phenols and other constituents of the steam distillate. (Auth. Abs.)

71-0811. Comstock, G. W., Shah, F. K., Meyer, M. B., Abbey, H. **Low Birth Weight and Neonatal Mortality Rate Related to Maternal Smoking and Socioeconomic Status.** *American Journal of Obstetrics and Gynecology* 111(1):53-59, September 1, 1971.

Neonatal deaths occurring over a 10-year period among infants born to nonsmoking and smoking mothers enumerated in a nonofficial census of Washington County, Maryland, were compared with a sample of live births from the same population. In addition to maternal smoking, low birth weight, and neonatal mortality rate, a considerable number of demographic and socioeconomic characteristics were studied. Smoking mothers consistently had a higher proportion of small babies regardless of almost all other characteristics. Neonatal mortality rate was approximately 40 percent higher among infants born to smokers than among those born to nonsmokers. The excess among smokers was most marked among families who ranked low on socioeconomic characteristics. The hypothesis is advanced that hypoxia resulting from increased maternal and fetal carboxyhemoglobin levels is the factor responsible for both the decrease in birth weight and the increase in neonatal mortality rate among infants born to smoking mothers. (Auth. Abs.)

71-0812. Conney, A. H., Welch, R., Kuntzman, R., Chang, R., Jacobson, M., Munro-Faure, A. D., Peck, A. W., Bye, A., Poland, A., Poppers, P. J., Finster, M., Wolff, J. A. **Effects of Environmental Chemicals on the Metabolism of Drugs, Carcinogens, and Normal Body Constituents in Man.** *Annals of the New York Academy of Sciences* 179:155-172, July 6, 1971.

A detailed review is presented of several studies on the effects of some environmental chemicals on microsomal function in man, including DDT, piperonyl butoxide, and cigarette smoking. Laboratory animal studies have shown that 3,4-benzopyrene or certain other polycyclic aromatic hydrocarbons induce the synthesis of aryl hydroxylases in liver microsomes and other organs, which inhibit the carcinogenicity of several chemical carcinogens. A study on the effect of cigarette smoking on benzopyrene hydroxylase activity in the human placenta revealed enzyme activity in all women who smoked 10-40 cigarettes daily and little or none in nonsmokers. Placental benzopyrene hydroxylase activity in smokers of 15-20 cigarettes daily varied more than 70-fold, which may explain why some people develop cancer when exposed to cigarette smoke or other carcinogens whereas other do not. A study of the oxidative N-demethylation of 3-methyl-4-monomethylaminoazobenzene to 3-methyl-4-aminoazobenzene by human placentas from cigarette smokers and nonsmokers showed N-demethylase activity in all the placentas from smokers and little or none in placentas from nonsmokers. Several polycyclic aromatic hydrocarbons were found to induce benzopyrene hydroxylase activity in the rat placenta, with 1,2-benzanthracene being the most potent. A recent study indicated that cigarette smoking enhances the *in vivo* metabolism of nicotine in man, which may explain the tolerance to nicotine that occurs in smokers. Studies on the effect of cigarette smoking on the metabolism of steroids and other body constituents by the placenta indicates that the aromatization of delta^4-androstene-3,17-dione to estrogens by placenta is not catalyzed by the same enzyme system that metabolizes 3,4-benzopyrene and aminoazo dyes. Although treatment of animals with polycyclic aromatic hydrocarbons was found to stimulate microsomal glucuronyl transferase activity, the newborn of cigarette smokers had the same transient hyperbilirubinemia as newborn in a control population.

71-0813. Gager, F. L. (Jr.), Nedlock, J. W., Martin, W. J. **Tobacco Additives and Cigarette Smoke. Part I. Transfer of D-Glucose, Sucrose, and Their Degradation Products to the Smoke.** *Carbohydrate Research* 17(2):327-333, 1971.

Uniformly labeled D-glucose-^{14}C and sucrose-^{14}C added to the burley portion of an American-blend cigarette were largely consumed during smoking. Small proportions (about 0.5 percent) of both sugars were transferred into the smoke unchanged. Even smaller proportions of activity were detected in the 5-(hydroxymethyl)-2-furaldehyde (HMF) and 5-methyl-2-furaldehyde present in the neutral fraction of smoke. Nonvolatile acids, bases, and phenols were also formed. An accumulation of HMF and 1,6-anhydro-beta-D-glucopyranose was found in the unburned, tobacco stub. (Auth. Abs.)

71-0814. Gager, F. L. (Jr.), Nedlock, J. W., Martin, W. J. **Tobacco Additives and Cigarette Smoke. Part II. Organic, Gas-Phase Products From D-Glucose and Sucrose.** *Carbohydrate Research* 17(2):335-339, 1971.

Thirteen gas-phase components of smoke were formed, in part, from uniformly labeled D-glucose-^{14}C and sucrose-^{14}C that had been added to the burley portion of a cigarette blend. The compounds, mainly furans and carbonyls, were isolated and identified by gas-chromatographic and mass-spectrometric techniques, coupled with nondestructive detection of radioactivity. The interaction of the sugars, or products thereof, with nitrogen-containing materials resulted in the formation of labeled acetonitrile. Although acetone and acetaldehyde were among the products formed in highest radiochemical yields (0.05 to 0.1 percent), they were greatly diluted by their formation from other precursors. The relative contributions to the smoke from the sugars added were greatest for the furans, intermediate for acetonitrile, and smallest for the carbonyls. (Auth. Abs.)

71-0815. Glick, S. D., Zimmerberg, B., Jarvik, M. E. **Titration of Oral Nicotine Intake With Smoking Behavior in Monkeys.** *Nature* 233(5316):207-208, September 17, 1971.

Four Rhesus monkeys were trained to puff on two tubes, one delivering cigarette smoke and the other air, in return for water. All four monkeys preferred smoke to air. Nicotine tartrate in doses ranging from 50 to 200 mg was dissolved in 700 ml of this water, of which the monkeys would usually consume only 300-400 ml during a puffing session. The oral nicotine was found to significantly decrease and in some cases reverse the smoke–air preference without significantly affecting the overall puffing rate. In a related experiment, a dose of 0.8 mg/kg of mecamylamine was injected intramuscularly 15 minutes before the beginning of a puffing session. Results showed that mecamylamine alone and in combination with oral nicotine significantly decreased overall puffing. However, the inhibition of smoking produced by the combination was significantly greater than that produced by either oral nicotine or mecamylamine alone.

71-0816. Goldfarb, J. **Action of Nicotine on Reflexes in Spinal Cats.** *Neuropharmacology* 10:399-412, 1971.

The effects of nicotine bitartrate on spinal reflexes were studied in cats with spinal section. Intravenous nicotine bitartrate routinely depressed monosynaptic reflexes. The depression of the monosynaptic reflex by nicotine can be blocked by raising the arterial blood pH either by hyperventilating the animal or by infusing sodium bicarbonate while maintaining end respiratory PCO_2 at 4 percent. The effect of pH on the nicotine response is not secondary to an increased monosynaptic reflex amplitude or to local vasoconstriction. Volleys in ipsilateral cutaneous afferents can also reduce nicotine-induced depression of the monosynaptic reflex. Intravenous nicotine bitartrate almost invariably caused an increase in the amplitude of the polysynaptic reflex, which was not dependent on nicotine's stimulation of peripheral afferent endings. One mechanism by which nicotine increased the polysynaptic reflex is presumed to be stimulation of Renshaw cells, since recurrent conditioning often yielded monosynaptic reflex inhibition accompanied by polysynaptic reflex augmentation. Nicotine effectively blocked recurrent inhibition, both during the period of reduction of the monosynaptic reflex and following the return of the reflex to within 10 percent of control levels. The block was also observed following doses of nicotine which had only minimal effects on the monosynaptic reflex. Doses of nicotine large enough to reduce the monosynaptic reflex to at least 25 percent of control produced a transient reversal of recurrent inhibition to recurrent facilitation, when the conditioning and testing motor nerves belonged to closely related muscles. (Auth. Abs.)

71-0817. Guillerm, R. **Composition et Effets Biologiques de la Fumee du Tabac. [Composition and Biological Effects of Tobacco Smoke.]** *Vie Medicale* 52(25):2997-3006, July 1971, French.

The chemical composition and the biological effects of tobacco smoke are discussed based on a review of studies on tobacco smoke toxicology and experimental results. Detailed analyses of all physiopathological effects of tobacco smoke are recommended with a special effort made to determine more precisely the nature and relative importance of carcinogens present in tobacco. Selection of the type of tobacco used and improvement of filters should lead to further knowledge of the components of tobacco smoke which should be eliminated.

71-0818. Hall, G. H., Myers, R. D. **Hypothermia Produced by Nicotine Perfused Through the Cerebral Ventricles of the Unanaesthetized Monkey.** *Neuropharmacology* 10:391-398, 1971.

Nicotine perfused through the cerebral ventricles of the unanesthetized monkey caused a fall in body temperature. No significant changes were observed in other physiological or behavioral parameters. Hypothermia also occurred following perfusion with an acetylcholine–eserine mixture or noradrenaline. The onset of the response to acetylcholine–eserine was more rapid, and the duration of action shorter than the response to either nicotine or noradrenaline. The results suggest that nicotinic receptors may exist within the hypothalamic thermoregulatory pathways which mediate the hypothermic response. (Auth. Abs.)

71-0819. Harke, H.-P. **Contribution to the Problem of Passive Smoking.** Complete English translation of "Zum Problem des 'Passiv-Rauchens'," *Munchener Medizinische Wochenschrift* 113(18):710-713, April 30, 1971.

Criticisms by F. Schmidt, H. Hess, and F. Porthein of the author's investigations on passive smoking are rebutted on a point by point basis as part of a continuing debate *See* Abstracts 71-0723 and 71-0733 for the original criticisms by Hess and Portheine, and Abstract 71-0023 of Harke's original publication.

71-0820. Howes, C. D., Batra, P. P. **Accumulation of Lycopene and Inhibition of Cyclic Carotenoids in Mycobacterium in the Presence of Nicotine.** *Biochimica et Biophysica Acta* 222(1):174-179, October 27, 1970.

In *Mycobacterium marinum*, carotenoid synthesis can be induced either with light or with antimycin A. The major polyene (90 percent) synthesized is betacarotene. However, when the induced cells are incubated in the presence of nicotine (5 mM), lycopene accumulates rather than beta-carotene. On nicotine removal, the accumulated lycopene is converted to beta-carotene. These results, therefore, show that nicotine acts by inhibiting the cyclization step, and that lycopene can be cyclized in this organism. (Auth. Abs.)

71-0821. Ivanov, N. G., Mokhnachev, I. G., Astakhova, L. G. **Predecessors of Organic Acid in Tobacco Smoke.** Complete English translation of "Predshestvenitsi na Organichnite Kiselini v Tyutyuneviya Dim" *Bulgarski Tyutyun* 14(5):52-62, 1969.

Tests were conducted to determine the predecessors of organic acids in tobacco combustion using the Ostrolist 450 variety as a sample tobacco. Results showed that generally, the predecessors of acids in smoke include both tobacco substances extracted with organic solvents and water, and those remaining in washed tobacco but producing various groups of acids. In the burning of tobacco, large quantities of volatile acids are formed. The lower acids in tobacco and the polysaccharides (cellulose, etc.) are the basic sources of acids with C_1 to C_4 carbon atoms, whereas the source of volatile acids with C_4 to C_6 carbon atoms is found in substances within the neutral fraction of organic extracts–esters, waxes, alcohols, etc. The non-volatile acids in tobacco pass partially into the smoke without essentially changing, showing a tendency toward a slight shortening of the carbon chain. The main portion undergoes profound pyrolytic changes linked with the formation of lower acids and other pyrolytic products. The non-volatile acids in smoke are mainly formed from the substances in the neutral fractions of the petroleum and ether extracts and some substances in washed tobacco.

71-0822. Kaburaki, Y., Kusakabe, H., Shigematsu, H. **Tabako no Kemuri Seibun ni Kansuru Kenkyu. VII. Tabako Kemuri no Kihatsusei Fenorurui no Sosei. [Studies on Composition of Tobacco Smoke. VII. Composition of Volatile Phenol Fraction of Tobacco Smoke.]** *Nippon Senbai Kosha Chuo Kenkyusho Kenkyu Hokoku* 110:121-125, 1968, Japanese.

The composition of volatile phenol fraction from the smoke of various unblended cigarettes was elucidated by a gas chromatographic method. The phenols separately determined were phenol, all isomers of cresol, xylenol, ethylphenol and methoxyphenol, and 3 isomers of trimethylphenol. Although the ratio of each phenol to total phenol in smoke was not so altered with the type of tobacco, minor variations were found in some types of tobacco. The ratio of p-cresol to total phenol was slightly lower for the flue-cured tobacco smoke, and that of phenol was lower and that of p-substituted phenols was higher for Mito No. 3 (Burley) tobacco smoke. The major volatile phenols in smoke were phenol, 3 isomers of cresol, guaiacol, p-ethylphenol and 2,4-xylenol, which amounted to about 90 percent of the total volatile phenol estimated. Concentration of volatile phenols in crude condensate of smoke was higher in that of Bright Yellow and Izumir A tobacco than native and Burley tobacco. (Auth. Abs. Mod.)

71-0823. Kaburaki, Y., Sugawara, S., Kobashi, U., Doihara, Y. **Tabako no Kemuri Seibun ni Kansuru Kenkyu. XIV. Nikochin no Netsubunkai ni Okeru Piri-jinuri no Seisei ni Tsuite. [Composition of Tobacco Smoke. Part XIV. Formation of Pyridines in Pyrolysis of Nicotine.]** *Nogyo Denka* 44(5):224-231, May 1970, Japanese.

Nicotine and various pyridine homologues were pyrolyzed in the nitrogen and air atmosphere using an unpacked quartz tube as a reactor. All kinds of isomers of lutidine and 2- and 4-picolines were identified in the pyrolytic products of nicotine at 600-800°C besides 3-substituted pyridines and other products reported by earlier workers. Upon pyrolysis at 700-800°C, any kinds of picolines yielded all kinds of picoline isomers, lutidines, pyridine, quinoline, isoquinoline and 2,2′-dipyridyl. Ethylpyridines and vinylpyridines, being interconverted at 700-800°C, yielded mainly the corresponding picolines and pyridine. The yield ratio of quinoline to isoquinoline varied according to the substituted position of the ethylpyridines and vinylpyridines pyrolyzed. 3-Acetylpyridien was produced from 3-ethylpyridine in air atmosphere at 700°C. 3-Cyanopyridine was pyrolyzed at 800°C to yield low molecular weight compounds without pyridine nucleus. It seems to suggest that no intermediate pyridine compounds are involved in the pyrolysis. From these findings, the thermal degradation pathway of nicotine was proposed. It was concluded that the potential source of pyridines including pyridines other than 3-substitution in tobacco smoke is nicotine in tobacco leaf. (Auth. Abs. Mod.)

71-0824. Lazzarini, L. **Medical-Legal Aspects of Smoking in a Closed Environment.** Complete English translation of "Aspetti Medico-Legali del Fumare in Ambienti Chiusi,"*Economia Umana* 6:20, 1955.

Smoking in a closed environment, such as public entertainment and meeting places, is shown to expose both smokers and nonsmokers to harmful tobacco combustion products. The nonsmoker may breathe in up to a third or more of the smoke produced by the smoker.

71-0825. Leuchtenberger, C., Leuchtenberger, R. **The Behavior of Macrophages in Lung Cultures After Exposure to Cigarette Smoke. Evidence for Selective Inhibition by Particulate Matter and Stimulation by the Gas Phase of Cell Metabolism of Alveolar Macrophages.** *Advances in Experimental Medicine and Biology* 15:347-360, 1971.

The biological effects of charcoal-filtered whole cigarette smoke or its gas phase on alveolar macrophages and epithelioid cells in cultures of lung explants from Snell's mice and Golden hamsters were investigated. In each of 20 experiments a minimum of six groups was used, each group consisting of four matched cultures: two controls, one exposed to whole charcoal-filtered (WCF) cigarette smoke, and one exposed to the gas phase (GCF) of charcoal-filtered cigarette smoke. Each culture was exposed daily to 2-4 puffs of 8 ml, each of 2-second duration, with an interval of 58 seconds between each puff. Results showed that after 4-6 days of exposure to WCF smoke, the number of outgrowing macrophages was markedly reduced, while after exposure to GCF smoke, the number was essentially the same as in control cultures. This reduction of cells following WCF smoke did not involve the epithelioid cells but was a selective damage to alveolar macrophages. Since the gas phase alone did not have this effect, it was assumed that the damage was due to particular matter in the cigarette smoke. Although WCF smoke did not directly affect the number or morphology of the epithelioid cells, there was a gradual alteration in their growth behavior. Specifically, these cells displayed a loss of contact inhibition, an increase in size of cells, nuclei and nucleoli, and a tendency for sheet and criss-cross formation. A stimulation of DNA synthesis of alveolar macrophages due to the GCF smoke was observed. These results point to the greater sensitivity of alveolar macrophages to factors from charcoal-filtered cigarette smoke. They also show that the particulate matter of smoke has a biological activity quite different from that of the gas phase.

71-0826. MacKenzie, W. F., Patrick, R. L. (Jr.), Monteleone, P. N. (Jr.). **Pathology in Animals Exposed to High Concentrations of Carbon Monoxide for Six Months.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 23-29.

Rats, mice, baboons, rhesus monkeys, and beagle dogs were exposed to 460 mg/M^3 CO for 71 days followed by 575 mg/M^3 CO for 97 days in a 68-percent O_2, 32-percent N_2, 5-psi environment. Anatomic changes found were confined to rodents and consisted of an increase in heart and spleen weights. This can be explained on the basis of increased RBC volume and blood viscosity. The possibility that the rats had begun to reach the maximum tolerable compensatory increase in RBC volume must be considered based on the death of two rats on the 166th day of exposure with lesions suggestive of circulatory complications. No anatomic changes were found in the other species. Based on the pathologic studies, it is indicated that CO has no direct effect on the body that produces a degenerative anatomic change. The animals at risk in this experiment were young healthy adults in the case of the rodents and dogs and healthy adolescent primates. They are not representative of the human population at risk in a civilian community. However, it does seem that the body's ability to adjust to high CO levels is much greater than had been previously suspected and is limited mainly by available circulatory reserve. (Auth. Abs. Mod.)

71-0827. Maly, E. **A Simple Test for Exposure to Polycyclic Hydrocarbons.** *Bulletin of Environmental*

Contamination and Toxicology 6(5):422-425, September-October 1971.

A procedure is described for determining polycyclic hydrocarbons in the urine of smokers or workers exposed to airborn particulates containing high temperature tar. The procedure involves the isolation of a polycyclic hydrocarbon mixture from a urine sample, separation of the hydrocarbons by paper chromatography, and semi-quantitative determination of the amount of certain hydrocarbons by measuring the horizontal diameter of the ultraviolet fluorescent spots, in particular that due to 1,2,3,4-dibenzopyrene. Other spots which can be identified include those due to 3,4-benzfluoranthene, fluoranthene, and 3,4-benzopyrene.

71-0828. Mann, P.E.G., Cohen, A. B., Finley, T. N., Ladman, A. J. **Alveolar Macrophages. Structural and Functional Differences Between Nonsmokers and Smokers of Marijuana and Tobacco.** *Laboratory Investigation* 25(2):111-120, August 1971.

Alveolar macrophages for functional study were obtained from nonsmokers, marijuana smokers, and tobacco smokers. Morphologic comparisons were made of macrophages from nonsmokers and marijuana smokers. These comparisons of marijuana smokers' and nonsmokers' macrophages revealed ultrastructural differences confined to the cytoplasmic inclusions. Needle-shaped structures and pale, often circular areas within inclusions were common in macrophages recovered from the lungs of marijuana smokers but were rarely observed in the cells of nonsmokers. Large pale areas within inclusions and highly electron-dense areas within inclusions were virtually confined to the cytoplasm of macrophages from marijuana smokers. Functional comparisons of macrophages from nonsmoking volunteers and from smokers of either marijuana or tobacco showed that these cells have similar capacities to ingest heat-killed *Candida albicans.* However, a higher percentage of macrophages from smokers of marijuana and tobacco adhered to glass than did those from nonsmokers–perhaps indicating a difference in net negative surface charge. The functional differences found between the macrophages of tobacco and marijuana smokers and nonsmokers do not indicate a diminution in the defensive capacity of these cells. However, fewer macrophages were recovered from marijuana smokers than from nonsmokers. (Auth. Abs.)

71-0829. Mokhnachev, I. G., Popova, L. P., Sirotenko, A. A., Dulan, L. A., Kamenshchikova, S. V., Kanevcheva, I. S., Kovtunov, V. S., Lateyeva, D. N., Pisklov, V. P., Serdyuk, L. G. **Sovremennyye Fiziko-khimicheskiye Metody Analiza Tabaka i Yego Dyma. [Current Physicochemical Methods of Analyzing Tobacco and Tobacco Smoke.]** *Sbornki Nauchno-Issledovatel'skikh Rabot, Vsesoyuznyi Nauchno-Issledovatel'skii Institut Tabaka i Makhorki im. A. I. Mikoyana* 154:197-222, 1969, Russian.

Current application of the varied types of chromatography (gas, paper, thin-layer and column), mass spectrometry and spectrophotometry are reviewed. The advantages of each method for the identification and determination of volatile and non-volatile components are noted.

71-0830. Murphy, J. F., Mulcahy, R. **The Effect of Age, Parity, and Cigarette Smoking on Baby Weight.** *American Journal of Obstetrics and Gynecology* 111(1):22-25, September 1, 1971.

The effects of maternal age, parity, and cigarette smoking on baby weight are reported in 10,692 mothers. Maternal age and parity have no significant effect, but cigarette smoking is associated with a highly significant reduction in baby weight. The effect of smoking is dose-related up to a consumption of 10 to 12 cigarettes per day. Some possible mechanisms of the action of cigarette smoking are reviewed. The adverse effect of increased carboxyhemoglobin in the fetal blood in the earlier months of pregnancy is considered as a possible cause of later retarded fetal growth and development. (Auth. Abs.)

71-0831. O'Donnell, R. D., Chikos, P. M., Theodore, J. **Human Sleep Patterns and Psychomotor Performance During Exposure to Moderate Concentrations of Carbon Monoxide.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 31-47.

Four healthy nonsmoking males were allowed to sleep for a normal period of time in the presence of carbon monoxide (CO) at a level up to 150 ppm. There were no major disruptions of either their sleep patterns or subsequent psychomotor performance involving time estimation, mental arithmetic, tracking, or vigilance under either moderate or high workloads. With respect to the performance measures, no patterns were isolated which would indicate that more detailed study under the same conditions would yield any significant effects of CO exposure. Some extremely tenuous indications of possible changes in the mobility of subjects during their early stages of sleep were found.

71-0832. Rose, C. S. **Acute Toxicity of Carbon Monoxide Under Hyperbaric Conditions.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 77-85.

The toxicity of carbon monoxide (CO) was evaluated under conditions of elevated pressure to determine if a pressurized environment would result in an altered response of an animal to the gas. The animals used were male Sprague-Dawley-derived rats, male Swiss albino mice, and male Hartley-derived guinea pigs. Two criteria were used to evaluate CO toxicity: 1) a comparison of the LC_{50} of CO at ambient atmospheric pressure and at elevated pressures, and 2) the percent of hemoglobin in animals which died during exposure. There was little variation in the absolute amount of CO at the 50 percent mortality level in the animals as the pressure was increased from 0 to 100 psig. The guinea pigs were considerably less susceptible to CO intoxication at all pressures than were the rats and mice. This phenomenon correlates with the lower affinity constant of hemoglobin for CO in guinea pigs than in either rats or mice. The carboxyhemoglobin levels producing death in rats and guinea pigs and the partial pressure gas ratios exhibited little variation regardless of the total pressure of the exposure environment. The results indicate that the toxicity of CO is not altered by increases in ambient pressure up to approximately 8 ATA provided the partial pressure of oxygen in the atmosphere remains constant.

71-0833. Rose, E. F., Rose, M. **Carbon Monoxide: A Challenge to the Physician.** *Clinical Medicine* 78(8):12-21, August 1971.

Carbon monoxide (CO) is the most common air pollutant in the U.S. and atmospheric concentrations are increasing. The insidious effect of low atmospheric concentrations of CO in producing or accelerating chronic ailments should be kept in mind by the physician. The amount of CO in cigarette smoke varies between 1 and 2.5 percent by volume and in the average smoker, the CO concentration reaching the alveoli is about 0.04 percent. Smokers of from 20 to 30 cigarettes daily have carboxyhemoglobin (COHb) levels ranging from 3 to 10 percent, but CO from the ambient atmosphere is not additive since CO is absorbed into the bloodstream only when the pressure of CO in the ambient air exceeds that in the pulmonary capillary blood. High COHb concentrations lower the altitude tolerance by about 335 feet for every percent of COHb, and explains why smoking is not recommended for athletes. The significance of CO as a contributing or causative factor in automobile accidents, both as a result of exhaust leakage and cigarette smoking, should be considered. Epidemiological studies of cigarette smokers indicate that the death rate from coronary heart disease is considerably higher for smokers than for nonsmokers and in patients with heart disease there is a deterioration of cardiac-function indices at COHb levels of 7 to 9 percent. Anginal symptoms associated with cigarette smoking have been observed in anatomically normal individuals. The role of cigarettes in birth weight and in abnormal births and development has not been defined, for although CO may be implicated, nicotine and other smoke components, or other as yet unidentified factors, may be responsible. Drunken drivers should be examined for the alternative possibility of CO intoxication. The effects of alcohol are aggravated by the effects of CO, for both influence the mind and impair muscular coordination and control. Neurological complications occasionally follow apparently complete recovery from CO poisoning. All CO poisoning must be vigorously treated with 100 percent oxygen, under hyperbaric conditions where possible.

71-0834. Ryser, J.J.-P. **Chemical Carcinogenesis.** *New England Journal of Medicine* 285(13):721-734, September 23, 1971.

This report summarizes the major contributions of chemical carcinogenesis to the understanding of cancer. The article attempts to place recent contributions in the perspective of the classic data of the past, discuss the biologic characteristics of carcinogenesis, describe the chemical interaction between cells and carcinogens, and postulate the sequence of events that may lead from exposure to clinical cancer. It is emphasized that weak carcinogenic exposures have irreversible and additive effects and cannot be dismissed lightly as standing 'below a threshold of action.' The irreversibility of initiation may sound discouraging to a person, like a heavy and long-time smoker, who has undergone severe carcinogenic exposure. Statistics show, however, that the incidence of cancer among heavy smokers who stopped smoking drops more dramatically than was anticipated. This is due to the presence, in tobacco smoke, of both initiators (hydrocarbons) and promoters (phenols). Thus, when both factors are removed, the irreversible effects of past initiation may remain unexpressed for the rest of a lifetime. This should encourage cigarette smokers of all vintages to kick the habit.

71-0835. Sanyal, R. K., Khanna, S. K. **Action of Cholinergic Drugs on Motility of Spermatozoa.** *Fertility and Sterility* 22(6):356-359, June 1971.

Acetylcholine in low concentrations produced an increase in the motility of oval cell spermatozoa. Similar concentrations produced either no effect or a slight decrease in motility of round cell spermatozoa. The stimulant effect was most marked in a concentration of 10^{-9} g/ml and was slow to develop, though it lasted for 4-5 hours. The action was potentiated by eserine and blocked by atropine. Low doses of nicotine and carbachol had similar actions, but they were quantitatively weaker than those of acetylcholine. Pilocarpine markedly reduced the motility of round cells, at the same time, it produced some stimulation of oval cells. (Auth. Abs.)

71-0836. Scassellati Sforzolini, G., Savino, A. **Azione Dell'Ozono su Alcuni Indici Chimici di Inquinamento Degli Ambienti Confinati. [Action of Ozone on Several Chemical Indices of Air Pollution in Closed Areas.]** *Revista Italiana d'Igiene* 29-30(3/4):174-188, May-August 1970, Italian.

The action of ozone on several chemical indices of environmental contamination by cigarette smoke and automobile exhaust gases has been studied. Using ozone in a concentration of 0.05 ppm (maximum allowable concentration), the ozone was found to considerably reduce (32 percent) the carbon monoxide content of room air and to oxidize formaldehyde to a slighter extent (18 percent). Ozone had no effect on the concentrations of nicotine. In garage air, the same concentration of ozone exercised a remarkable oxidizing action on carbon monoxide (37-percent reduction), taken as the index of ambient contamination.

71-0837. Schmeltz, I. **Cigarette Smoke: Formation of Components and Modification of Composition by the Use of Additives.** *International Scientific Tobacco Congress*, 5th, Hamburg, 1970, pp. 85-94.

The origin of various cigarette smoke components, including phenols, pyridine bases, polynuclear and other aromatic hydrocarbons, indoles, alkenes and smoke gases, is discussed. Special attention is given to studies in which specific tobacco leaf constituents, related compounds and tobacco leaf extracts were pyrolyzed to determine which leaf constituents serve as precursors for the various substances found in smoke. Thus, phenols were shown to arise from carbohydrates, pigment, lignin and others; pyridine bases essentially from nicotine; indole and related compounds from tryptophan, other amino acids and proteinaceous materials; alkenes from long chain paraffins and similar substances; and smoke gases from a variety of sources. In addition, the report describes the modification of cigarette smoke by the use of additives. Additives discussed include those whose effects were measured by noting resulting changes in: 1) the burn temperature of cigarettes; 2) the smoke composition, in the particulate or vapor phase; and 3) the pH of smoke. Data presented compare the burn temperature of cigarettes containing certain additives with the burn temperature of reference cigarettes. Levels of certain significant components of the vapor and particulate phases are tabulated for both additive-treated cigarettes and reference cigarettes. The mechanism by which certain additives exert their effects is also discussed. (Auth. Abs.)

71-0838. Schmidt, F. **Concerning the Problem of Passive Smoking.** Complete English translation of "Zum Problem des 'Passiv-Rauchens'," *Munchener Medizinische Wochenschrift* 113(18):702-705, April 30, 1971.

Criticism of a study by H. P. Harke concerning the problem of passive smoking is offered by F. Schmidt. The latter strongly questions Harke's conclusions which seem to infer that the dangers of passive smoking are minimal and which are based on what Schmidt considers to be inadequate experimental methods and incomplete publication of data relating to the subject. A rebuttal to these criticisms is presented by Harke in another publication. (*See* Abstract 71-0023 of Harke's original publication and Abstract 71-0819 of his rebuttals.)

71-0839. Schulte, J. **The Effect of Exposure to Low Concentrations of Carbon Monoxide.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 87-91.

Some research projects concerning the effects of low concentrations of carbon monoxide (CO) are briefly described. One study showed that exposure to different CO concentrations resulting in carboxyhemoglobin (COHb) levels of 5, 10, 15 and 25 percent caused an increase in errors in an arithmetic test. Another experiment revealed that drivers with COHb levels of between 5 and 10 percent had an increase in judgmental error, especially in maintaining and closing distances. Possible explanations for the differences in the findings among researchers in the area of CO effects are discussed.

71-0840. Sotgiu, P., Ruffi, A., Pepeu, P. **Behavioural Effects Caused by Intra-arterial Injection of Acetylcholine and Nicotine in Conscious Rats.** *Pharmacological Research Communications* 3(1):45-53, March 1971.

The effects of acetylcholine and of nicotine injected retrogradely into the right carotid artery in conscious, freely moving rats were investigated. Acetylcholine and nicotine caused two completely different syndromes, the first characterized by flexion of the forelimb, rotation of the head and squeaking, the second by a fall on the left side with extension of the right forelimb. Both syndromes are prevented by pretreatment with mecamylamine but not with atropine. The effects elicited by acetylcholine are also prevented by morphine suggesting that they might represent a reaction to a nociceptive stimulus. (Auth. Abs.)

71-0841. Tamura, K., Endoh, M., Hashimoto, K. **Pharmacological Features of the Gall Bladder and Its Vascular Bed of the Dog** *In Situ*. *Tohoku Journal of Experimental Medicine* 104(2):157-169, June 1971.

Pharmacological features of the gall bladder and its vascular bed were studied by means of the intra-arterial administration of various substances in the dog *in situ*. The contraction of the gall bladder was produced by various compounds as follows: cholinergic drugs, kinin substances, histamine, ganglion stimulants, ouabain, $BaCl_2$ and $CaCl_2$. Meanwhile, adrenergic drugs ganglion blocking agents, lys-vasopressin, smooth muscle relaxants. KCl and $MgCl_2$ relaxed the gall bladder. DMPP, 5-HT, nicotine, lobeline, angiotensin and ATP caused a biphasic response, i.e., a contraction followed by a relaxation or a relaxation followed by a contraction. The pharmacological features of cholecystic arteries are not the same as those of the gall bladder: cholinergic and adrenergic drugs except isoprenaline, and ganglion stimulating and blocking agents produced opposite effects, while smooth muscle stimulants and relaxants acted similarly on both. Among polypeptides, lys-vasopressin relaxed the gall bladder, cholecystokinin constricted it, and gastrin and oxytocin caused no response, while the former constricted the artery and the latter three dilated it. (Auth. Abs.)

71-0842. Vapaatalo, H. I., Neuvonen, P. J., Tissari A., Mansner, R., Paasonen, M. K. **Effect of Cigarette Smoking on Diuresis Induced by Furosemide.** *Annals of Clinical Research* 3(3):159-162, 1971.

The effects of smoking were compared on water- and furosemide-induced diuresis in 170 healthy student volunteers. Smoking of one cigarette at the beginning of the experiment, or six cigarettes (one every 30 minutes) during the experiment, did not affect the total 3-hour water diuresis. The 3-hour diuresis induced by furosemide in nonsmokers was not significantly different from that of smokers. However, after six cigarettes the mean value in nonsmokers (who temporarily smoked less than 10 cigarettes daily) was 909 ml which is significantly less than the corresponding figure 1361 ml in routine smokers (more than 10 cigarettes daily). In two nonsmoking authors, three cigarettes at the beginning of the experiment caused a transient delay in the diuresis induced by furosemide, but, if anything, increased the total diuresis. The effect of smoking on the furosemide diuresis was concluded to be of negligible significance in clinical practice. However, increased smoking may somewhat reduce the effect of furosemide.

71-0843. Vernot, E. H., MacKenzie, W. F., MacEwen, J. D., Monteleone, P. N., George, M. E., Chikos, P. M., Back, K. C., Thomas, A. A., Haun, C. C. **Hematological Effects of Long-Term Continuous Animal Exposure to Carbon Monoxide.** In: Proceedings of the 1st Annual Conference on Environmental Toxicology, 9-11 September 1970. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, AMRL-TR-70-102, December 1970, pp. 7-22.

Long-term continuous exposures of dogs and monkeys to carbon monoxide (CO) produce series of measurable changes resulting from the development of normocytic, normochromic polycythemia. An increase in hematological parameters appears to be a linear function of CO concentration from the lowest, 57.5 mg/m^3, to the highest, 575 mg/m^3, tested. The monkeys responded relatively more profoundly than dogs by increases in hematological values. The Haldane M constant applies to the *in vivo* formation of carboxyhemoglobin, and can be calculated using inhalation data. The effect of exposure to high CO concentration on the oxygen dissociation curve appears to be explainable on the basis of Roughton's assumptions alone, the curve does not show any right shift attributable to adenosine triphosphate or 2,3 diphosphoglycerate. The polycythemia developed as a result of chronic exposure to high CO concentrations does not compensate completely in blood oxygen transport. Under the conditions of this study, arterio-venous difference in oxygen content provides no evidence of tissue hypoxia in equilibrated dogs. The increase in hematocrit in acclimatized dogs and monkeys is matched by equal increase in total blood volume. The viscosity of polycythemic blood can be explained on the basis of hematocrit increases alone. (Auth. Abs. Mod.)

71-0844. Walton, F. P. **Carcinogens in Cigarette Smoke. (Letter)** *Chemistry in Britain* 7(5):220-221, 1971.

This letter-to-the-editor suggests that lung cancer may be due to repeated and prolonged exposure of the lungs to a tissue irritant such as acrolein which is formed by decomposition of glycerine or similar substances during burning. Acrolein is also suggested as a causative factor in bronchitis, coronary thrombosis and the rapid spread of cancer throughout the body.

71-0845. Williams, J. F. **Collaborative Study of the Determination of Propylene Glycol, Glycerol, and Triethylene Glycol in Tobacco.** *Journal of the Association of Official Analytical Chemists* 54(3):561-564, 1971.

A continued collaborative study of the gas chromatographic determination of humectants in tobacco is reported. Six cased cigarette cut tobacco samples, 2 humectant mixture samples, and 2 ground and blended cased tobacco samples were sent to 13 collaborating laboratories. Results for propylene glycol and glycerol gave coefficients of variation of less than 10 percent. Triethylene glycol in cut tobacco at mean concentration levels of 0.95 and 1.30 percent gave coefficients of variation of 9.24 and 6.93 percent, respectively. At a mean concentration level of 0.54 percent triethylene glycol, the coefficient of variation was 20.8 percent. The method has been adopted as official first action by the AOAC.

71-0846. Williamson, T. G., Jenkins, R. W., Newman, R. H., Carpenter, R. D. **Analysis of Tobacco and Tobacco Smoke by Neutron Activation.** *Transactions of the American Nuclear Society* 14(1):110-111, 1971.

A neutron activation analysis technique is described for the analysis of 10 elements in main-stream smoke of a single cigarette, 6 of which have not been previously found using neutron activation methods. In this technique, no transfer of the smoke condensate prior to activation is necessary, thereby minimizing losses and contamination. The major advantages of the technique are 1) ability to assay single cigarettes, 2) adaptability for routine analytical determination, and 3) speed of sample preparation for activation.

71-0847. Yacoub, M., Faure, J., Mallion, J.-M., Cau, J. **Can the Tobacco Origin of Chronic Carbon Monoxide Intoxication Be Determined?** Complete English translation of "Peut-on Determiner l'Origine Tabagique de l'Oxycarbonisme Chronique?" *Medecine Legale et Dommage Corporel* 3(3):262-265, July-August-September 1970.

See Abstract 71-0041.

See also **71-0870, 71-0883, 71-0888, 71-0922, 71-0927, 71-0942**

MORTALITY AND MORBIDITY

71-0848. Elmes, P. C., Simpson, M.J.C. **Insulation Workers in Belfast. 3. Mortality 1940-66.** *British Journal of Industrial Medicine* 28(3):226-236, July 1971.

One hundred and seventy men were identified as making up the total population of insulation workers in Belfast in 1940. This is an analysis of all the information about deaths that has emerged from tracing these men up to the end of 1966. Five remain untraced, and the mortality experience of the remainder is compared with that of other men in Northern Ireland over the period. There were 98 deaths when only 37 were expected. The number of deaths occurring exceeded those expected throughout the period 1940-66 and the increase was statistically significant during the period 1950-55 and onwards. There was an especially high mortality (compared with other Northern Ireland males) due to cancer of the lung, mesothelioma of the pleura and peritoneum, cancer of the gastrointestinal tract, and fibrotic lesions of the lungs. The ratio of observed over expected deaths was 2.6 for all causes, 3.9 for all cancers, and 17.6 for cancers of the lower respiratory tract and pleura. Those men finally classified as dying from lung cancer showed evidence of lung fibrosis whereas those classified as dying from mesothelioma did not. Comparisons within the group failed to show any relationship between age at first exposure or duration of exposure and the excessive mortality. Taking those whose smoking habits were known (114) and comparing them with people surveyed by Wicken (1966) in Inner Belfast, it is evident that the insulators were heavy smokers. However, there were too few nonsmokers (5) to show the significance of smoking. (Auth. Abs.)

See also **71-0811**

NEOPLASTIC DISEASES

71-0849. Auerbach, O. **Lung Cancer From Cigaret Smoking.** *New York State Journal of Medicine* 71(17):2039-2040, September 1, 1971.

Microscopic examination of lung sections from 402 male smokers and nonsmokers showed lesions with cilia present in 11.8 percent of sections of nonsmokers, in 88 percent of sections from smokers of under one-half pack a day, and in 98.5 percent of sections from smokers of two or more packs a day. Lesions with cilia absent increased from 6 percent of sections from nonsmokers to 28.3 percent of sections from smokers of two or more packs a day. Bronchial epithelial lesions composed entirely of atypical cells and lacking cilia were termed "carcinoma in situ." The proportion of sections with such lesions increased tremendously with the amount of smoking, thus strengthening the epidemiologic evidence that cigarette smoking is a major factor in the causation of bronchogenic carcinoma. To determine if there was any difference in the changes in the bronchial epithelium between ex-smokers and smokers, slides from the lungs of 758 subjects (456 men and 302 women) who had died of cancer other than lung cancer were examined. Of the 456 males, 72 were ex-smokers who had smoked for at least 10 years, were primarily cigarette smokers, and had not smoked for at least 10 years prior to death. Atypical cells were observed in 93.2 percent of smokers, in 6 percent of ex-smokers and in 1.2 percent of nonsmokers. Carcinoma in situ was found in only 0.2 percent of ex-smokers. Of the 72 ex-smokers, 43 had one or more sections containing cells with disintegrating nuclei. The frequency of cells with disintegrating nuclei may increase for perhaps 15 years after cessation of smoking and then decrease gradually. These findings strengthen the conclusion that ex-smokers have a reduced risk of acquiring lung cancer.

71-0850. Cole P. **Coffee-Drinking and Cancer of the Lower Urinary Tract.** *Lancet* 1(7713):1335-1337, June 26, 1971.

Interviews were conducted with a population-based series of patients with cancer of the lower urinary tract and controls drawn from the same population. An unanticipated finding is association of the disease with coffee-drinking. The relative risk for coffee-drinkers, compared to non-drinkers, is 1.24 among men and 2.58 (p less than 0.05) among women. The association is strong in the sex-age groups in which the associations of the disease with cigarette smoking and occupation are not strong. (Auth. Abs.)

71-0851. Cragg, J. **Lung Cancer in Jersey: Its Incidence and Associated Biochemistry.** *British Journal of Clinical Practice* 25(8):360-365, August 1971.

The island of Jersey has one of the highest rates of lung cancer in the world despite negligible atmospheric pollution. In 1964-1968, 144 patients with lung cancer were studied. There was a 4:1 male to female distribution of the disease. Records of the smoking habits of 113 of these lung cancer patients showed most were heavy smokers, the average duration of smoking being 37 years and the average number of cigarettes smoked daily being 28. This degree of heavy smoking predominated in patients who developed epidermoid and undifferentiated tumors. There was no excessive incidence of lung cancer in any particular occupation. The diagnosis-death interval was short for all types of lung cancer but particularly so in the case of the oat cell tumor. Altered electrolytes and raised serum calcium levels were common in the presence of metastases but there was no clinical evidence of hypercalcemia. Hormonal activity in lung cancer was evidenced by a single case of dilutional hyponatremia in a patient with an oat cell tumor; there were also three cases of gynecomastia.

71-0852. Humperdinck, C. **Lunge und Berufskrebs. [Lungs and Occupational Cancers.]** *Medizinische Welt* 22(12):459-464, March 20, 1971, German.

A brief review is presented of carcinogens which are involved in the development of occupational cancers of the lung or respiratory system: radiation, arsenic, nickel cadmium, chromium, asbestos, aromatic amines, and aromatic hydrocarbons. It was emphasized that the manifestation of cancer is dependent upon many factors such as age at the initial exposure, latent period, previous history of lung diseases and smoking habits, all of which must be considered. The content of known carcinogens in tobacco smoke does not fully explain the carcinogenic effect of cigarettes. The author cites Wynder's experiments in inducing skin cancer in white mice with benzo(*a*)pyrene. Large concentrations of pyrene or fluoranthene potentiate the carcinogenic effect of benzo(*a*)pyrene but lower concentrations of either of the noncarcinogens have a carcinogenesis– inhibiting action.

71-0853. Kuschner, M., Laskin, S. **Experimental Models in Environmental Carcinogenesis.** *American Journal of Pathology* 64(1):183-196, July 1971.

Model systems developed to identify pulmonary carcinogenic agents, particularly those found in tobacco smoke, and the mechanisms of their action are described. One such model employs a wire-mesh pellet impregnated with a pure polycyclic hydrocarbon carcinogen that is impacted in the bronchus of a rat. This pellet implant model provides prolonged and persistent dose and in this regard is more comparable to a heavily contaminating smoking exposure. However, it traumatizes the bronchus and induces proliferative and metaplastic changes conducive to carcinogenic action. In another system, SO_2 exposure is combined with benzo(*a*)pyrene exposure by inhalation, resulting in squamous cell carcinomas of the bronchus. Although this model cannot be considered evidence for air pollution hazards because of the high concentrations used, it can be applied to the cigarette smoke problem where exposures to polycyclic hydrocarbons is combined with exposure to such irritants as nitrogen oxides, phenols and aldehydes. Thus, model systems are useful in assembling significant combinations of materials to demonstrate the multifactorial etiology of a tumor. Models can also isolate a specific carcinogen as is illustrated in the case of chromate. In addition to providing information on specific carcinogens and combination effects, models are useful in determining dose responses and both morphogenesis and pathogenesis. Models for environmental pulmonary carcinogenesis *in vitro* with cell and organ cultures have had limited application and success.

71-0854. Moore, C. **Cigarette Smoking and Cancer of the Mouth, Pharynx, and Larynx. A Continuing Study.** *Journal of the American Medical Association* 218(4):553-558, October 25, 1971.

A total of 203 smokers "cured" of cancers of the oral cavity, pharynx, or larynx were divided into two groups: those who continued smoking and those who stopped. Within an average follow-up period of approximately seven years, 40 percent of patients who continued to smoke tobacco developed second cancers in tobacco-contact tissues, whereas 6 percent of patients who stopped smoking tobacco acquired second cancers. The death rate from second cancers was high; deaths from other causes occurred more often and earlier among the continuing smokers. These results strongly support previous evidence that (1) tobacco plays a major role in cancers of the oral cavity, pharynx, and larynx; and (2) cessation of smoking reduces the risk of second such cancers. Stopping smoking may reduce premature deaths from some other common diseases. (Auth. Abs.)

71-0855. Morrow, R. C., Suarez, G. **Mucosal Changes and Cancer in Intra-Oral Smoking.** *Laryngoscope* 81(7):1020-1028, July 1971.

Of 79 reverse smokers examined at the Clinic "Club de Leones" of the University of Cartagena, Colombia, between June and December 1970, characteristic changes of nicotinic stomatitis were found in 78. All but seven of the subjects were women and they ranged in age from 25 to 90 years. Approximately 75 percent of the subjects had smoked for at least 20 years. Cigars, cigarettes, and calillas (a long, thin home-made cigar) were smoked and of the 79 subjects, 73 smoked six or less daily and two-thirds of these smoked no more than three per day. Squamous cell carcinomas were present in 16 subjects and were predominantly located at the base of the tongue, tonsillar fauces and adjacent pharyngeal mucosa. Two involved the hard palate and two the soft palate. There was little relationship between either the number of years of indulgence in reverse smoking or the number of cigars or cigarettes smoked and the severity of the stomatitis. But there was a definite relationship of cancer to the duration of smoking. The results suggest that two mechanisms may be involved in the pathological changes produced by reverse smoking. One appears to be the effect of drying and irritation by the smoke, leading to a nicotinic stomatitis and leukoplakia in the palate. The other seems to be a carcinogenic process resulting from a substance or substances collecting in the "draining area" of the mouth.

71-0856. Pindborg, J. J. **Oral Leukoplakia.** *Australian Dental Journal* 16:83-93, April 1971.

The prevalence and clinical aspects of oral leukoplamia are discussed and the homogeneous and speckled types of leukoplakia are described. A section on etiology deals with tobacco habits (in particular cigar and bidi smoking, and snuff dipping) and candida infected leukoplakias. The histopathology of leukoplakia is discussed with emphasis on the significance of epithelial atypia. Follow-up studies are mentioned and it is concluded that only 4 to 6 percent of the leukoplakias become malignant. The role of the World Health Organization with regard to oral precancerous conditions is mentioned. (Auth. Abs. Mod.)

71-0857. Reddy, C.R.R.M., Kameswari, V. R., Raju, M.V.S. **Carcinoma of the Palate in Visakhapatnam Area.** *Indian Journal of Cancer* 8(2):84-91, June 1971.

Biopsy records from the Andhra Medical College, Visakhapatnam, India, from December 1955 to December 1970 were analyzed for oral, oropharyngeal and hypopharyneal cancers according to age, sex and site. Of 21,264 reported malignancies, 2280 were intra-oral cancers, and of these 864 were palatal carcinomas. The most common sites for the intra-oral cancers were the palate, tongue, hypopharynx and cheek in descending order of frequency. Carcinoma of the hard palate was very common in the Visakhapatnam area as compared to other regions of India and other countries in the Middle East and South East Asia, and was more common among women. Carcinomas of all other sites were more common in males. A brief literature review is included in a discussion of the relationship of palatal cancer to reverse smoking.

71-0858. Sato, T. **Koto Gan Hassei ni Eikyo wo Ataeru Inshi. [Causative Factors in Laryngeal Cancer.]** *Japanese Journal of Clinical Medicine* 27(4):1257-1270, April 1969, Japanese.

In a review paper, results are quoted from a questionnaire survey carried out in Japan in 1967 to determine the incidence of smoking among 355 patients with laryngeal cancer. Ninety-seven percent of all patients smoked and 87 percent were heavy smokers. Figures are also given for the total numbers of male and female smokers in Japan in 1967 by age groups. On the average, 82 percent of all men and 17 percent of all women in Japan smoked in 1967.

71-0859. Wahi, P. N. **Recent Trends in Cancer Research.** *Indian Journal of Cancer* 7(3):161-173, September 1970.

One of the main trends in cancer research has been the epidemiological approach. Comparative world wide epidemiological studies have shown a wide variation in the incidence of certain cancers in different countries. Studies on various environmental factors in the etiology of certain cancers have been concerned with lung cancer and smoking, buccal cavity cancer and tobacco chewing, Burkitt's tumor and virus, cancer of the uterine cervix and marital status of women, breast cancer and lactation, thyroid cancer and diet and radiation, and leukemias and radiation. The role of viruses in the production of various cancers and the development of cancer chemotherapy are other significant trends in cancer research in recent years. In the field of cancer control and prevention, the understanding of the natural history of some cancers and the acceptance of the concept of precancer are significant contributions. The results of an epidemiological study on oral cancer are briefly described and clearly show that tobacco chewing enhances the risk of developing oral cancer with a clear dose-effect relationship. Epidemiological studies of cancer of the uterine cervix, which have highlighted some aspects of the ecological profile of Indian women predisposing them to a high incidence of cervical cancer, are reviewed.

71-0860. Zacho, A., Nielsen, J., Larsen, V. **Smoking Habits of Patients With Gastric Cancer.** *Acta Chirurgica Scandinavica* 137(5):455-458, 1971.

Five hundred and thirty-two patients with gastric cancer (GC) were compared, in respect to smoking habits, with a section of the general population. This investigation was complicated by the fact that many patients with GC had stopped smoking or had reduced their smoking before admission. The relative percentage of smokers among men and women corresponds in a striking way to the relative incidence of GC in the two sexes. Among the males there was a somewhat higher percentage of ever-smokers (both present smokers and ex-smokers) in the GC than in the control group. At admission to hospital there was a lower percentage, but 5 years previously a higher percentage of smokers in the GC group. The percental distribution of smokers in the various age groups differed in the two groups. Among the women there was a lower percentage of ever-smokers in the GC than in the control group, but a higher percentage of smokers at admission, and an even higher percentage 5 years before admission than in the control group. In other words, most female smokers with GC go on smoking until a few years before admission. These investigations have shown that it is not possible to solve the problem concerning the etiological role of tobacco in gastric cancer by simple retrospective studies, because individuals who later develop or who already have gastric cancer often react to a reduced tolerance of tobacco by reducing their smoking or stopping altogether. (Auth. Abs. Mod.)

See also **71-0810, 71-0844, 71-0875, 71-0877, 71-0879, 71-0944**

NON-NEOPLASTIC RESPIRATORY DISEASES

71-0861. Ericsson, P. **Importance of Certain Factors for Changes in Physical Work Capacity and Ventilatory Capacity During Five Years' Ageing.** *Acta Societatis Medicorum Upsaliensis* 75:131-149, 1970.

In a previous study concerning the effect of five years' aging on the ventilatory capacity and physical work capacity in apparently healthy persons of ages ranging from 57 to 71 years, representative of the population, a decrease of 6-9 percent was obtained in both sexes for measures of ventilatory capacity, and of 9-13 percent in and 10-25 percent in women for measures of physical work capacity. The individual variation was considerable, however. On the basis of these data, complementary analyses were performed with the aim of studying the of certain factors for these age-correlated changes and for the individual differences in the changes during the follow-up period. The investigation showed that the decrease in maximal physical work capacity was not due to any large extent to a decrease in the highest attainable heart rate but to a decreased work capacity per heart beat. When the physical work capacity was expressed in a lactate concentration dependent variable the reduction was greater than when the calculations were based on other variable systems. Statistically significant correlations were found both between change in measures of physical work capacity and change in ventilatory capacity and between change in body weight and change in physical work capacity and ventilatory capacity respectively. There appeared to be some relationship between the individual subject's own subjective assessment of his state of physical fitness and physical work capacity and ventilatory capacity, respectively. Changes observed in the smoking habits of some of the subjects showed no correlation with physical work capacity or ventilatory capacity. The hypothesis is presented that the effect of aging on physical work capacity might be due partly to a change in circulatory adaptation, with a redistribution of the circulating blood and reduction of the nutritive flow to exercising muscles. Possible effects of reduction of physical activity with increasing age are discussed. (Auth. Abs. Mod.)

71-0862. Femi-Pearse, D., Elebute, E. A. **Ventilatory Function in Healthy Adult Nigerians.** *Clinical Science* 41(3):203-211, September 1971.

Vital capacity (VC), forced expiratory volume in one second (FEV_1), functional residual capacity (FRC), expiratory reserve volume (ERV), residual volume (RV), and total lung capacity (TLC) were determined in 291 adult healthy Nigerians (174 males and 117 females). Prediction formulae of various authors on Caucasians and South African Bantu were applied to the Nigerian data. The results show significantly smaller VC, FEV_1, FRC, RV, TLC and RV/TLC in Nigerians than in Caucasians. The VC, FEV_1 and FRC of Nigerians were similar to those of South African Bantu. ERV values were similar to those previously reported for Caucasians. The combination of lower RV values and similar ERV indicates the possibility of less 'basal airway closure' in Nigerians. In comparison with nonsmokers, smokers showed a 5 percent diminution in VC and their RV/TLC ratio was 11.5 percent higher. However, these differences were not significant.

71-0863. Frasca, J. M., Auerbach, O., Parks, V. R., Jamieson, J. D. **Electron Microscopic Observations on Pulmonary Fibrosis and Emphysema in Smoking Dogs.** *Experimental and Molecular Pathology* 15(1):108-125, August 1971.

Electron microscopic observations in areas of fibrosis and emphysema of the lungs of dogs subjected to experimental cigarette smoking show that alterations occur both in the pleura and the lung parenchyma. In the pleura the major alteration is the increased thickness of the stroma due to large amounts of collagen present. In the lung parenchyma two major alterations appear in the interstitium of the alveolar septa where there is a complete loss or a great reduction in the number of capillaries and a marked thickening of the septa due to the increased amounts of collagen. Changes in the alveolar epithelium are slight; changes in capillary endothelium, such as rarefication of cytoplasm and blebbing of the plasmalemma, are found. More frequently noted are the changes involving the basement membrane of the alveolar epithelium which in some places appear to be greatly thickened and in others to be exceptionally thin or missing entirely. Another of the most striking alterations noted in both the pleura and parenchyma is the presence of large numbers of macrophages occurring singly, in clumps, and in granulomas. Although macrophages are found in the lungs of nonsmoking dogs, they are not found in such numbers nor with the unique content observed in the lungs of smoking dogs. Crystalline-like structures are found in membrane-bound inclusions and ferritin-like particles occur both in large membrane-bound aggregates and lying free in the cytoplasm. Conclusive identification of these structures and their relationship to inhalation of cigarette smoke requires further study. (Auth. Abs.)

71-0864. Giammona, S. T., Tocci, P., Webb, W. R. **Effects of Cigarette Smoke on Incorporation of Radioisotopically Labeled Palmitic Acid Into Pulmonary Surfactant and on Surface Activity of Canine Lung Extracts.** *American Review of Respiratory Disease* 104(3):358-367, September 1971.

The incorporation of radioisotopically labeled palmitic acid into pulmonary surfactant was studied in control dogs and dogs subjected to short term exposure to cigarette smoke. Autoradiographic and fatty acid analysis of serum, lung tissue, and lung extracts and measurements of surface activity were also carried out in these dogs. There was no change in surface activity or in the rate or time of incorporation of palmitic acid in these dogs. (Auth. Abs.)

71-0865. Golli, V. **Epidemiological Study of Non-Specific Bronchopathies.** Complete English translation of "Etude Epidemiologique des Bronchopathies Non Specifiques," *Bronches* 20(5):313-330, September-October 1970.

See Abstract 71-0442.

71-0866. Hagerup, L., Larsen, M. **Tobaksrygning og Respiratoriske Symptomer i en Dansk Population. Fra 50 Ars Undersogelsen i Glostrup. [Tobacco Smoking and Respiratory Symptoms in a Danish Population. From a 50-Year Study in Glostrup.]** *Ugeskrift for Laeger* 133(27):1302-1306, July 9, 1971, Danish.

The relationship of tobacco smoking to pulmonary function and respiratory symptoms was studied in a population of 50-year-olds (436 males and 366 females) from Glostrup, Denmark. A significant correlation was found between inhalation of tobacco smoke and morning cough in males. Ex-smokers showed a reduced pulmonary function as compared with nonsmokers. Pulmonary function was poorest in smokers and was related, in a complex manner, to inhalation and quantity of tobacco consumed. The effects of the type of smoking, duration of smoking, the amount smoked and inhalation are discussed. It was concluded that the pulmonary symptoms depend upon the quantity and nature of the inhaled cigarette smoke. However, cigar and shag smoking cannot be entirely acquitted.

71-0867. Knorre, G. v., Lange, U. **Ergebnisse einer Reihenuntersuchung auf Asthma, chronische Bronchitis und Emphysem. [Results of a Screening Test for Asthma, Chronic Bronchitis and Emphysema.]** *Zeitschrift fur Erkrankungen der Atmungsorgane mit Folia Bronchologica* 134(2):279-292, 1971, German.

In a rural-small town population of about 35,000 inhabitants above the age of 15 years, a total of 871 persons (683 men, 188 women) were found suffering from bronchial asthma, chronic bronchitis and emphysema. The patients were initially processed by standard questionnaire and arranged into the respective groups according to age, sex and smoking habits. Three-fourths of the men stated that they were smokers but only one-fifth of the women made such an admission. Chronic bronchitis was found linked with steady smoking whereas the emphysematous and asthmatic complaints were associated with seasonal or weather variations. The anamnestic, clinical, roentgenological and ECG findings are discussed in detail.

71-0868. Lee, D.H.K. **Coal Workers' Pneumoconiosis–State of Knowledge and Research Needs.** *Journal of Occupational Medicine* 13(4):183-192, April 1971.

Appalachian coal miners show a high incidence of respiratory disease characterized by dyspnea and bronchitic symptoms, often but not invariably accompanied by radiographic evidence of changes characteristic of pneumoconiosis. The symptoms and radiographic changes tend to progress with years of underground work, and a substantial portion of the pneumoconiotic cases develop the lesions characteristic of progressive massive fibrosis–about one-third of the affected working miners and about one-half of the affected former miners. Coal dust plays a major role in the causation and development of the disease, but infection, cigarette smoking and other factors interact to produce a pleomorphic clinical picture.

71-0869. Mittman, C., Lieberman, J., Marasso, F., Miranda, A. **Smoking and Chronic Obstructive Lung Disease in Alpha$_1$-Antitrypsin Deficiency.** *Chest* 60(3):214-221, September 1971.

Similar spectra of chronic obstructive lung disease were observed in eight patients with severe and 21 with intermediate alpha$_1$-antitrypsin deficiency, but patients with intermediate levels of protease inhibitor became ill when older and following greater cigarette exposure. In 61 presumably healthy relatives of these patients, almost one-half of those with intermediate antitrypsin deficiency who smoked had spirometric evidence of early airways obstruction. Relatives with normal antitrypsin activity did not show this change, nor were perfusion lung scan or diffusing capacity abnormalities as common in normal relatives as in deficient ones. The intermediate deficiency may predispose to lung disease by accentuating an individual's susceptibility to the harmful effects of external irritants. An interaction of genetic and environmental factors suggests that lung disease could be prevented by identifying asymptomatic, susceptible relatives and counseling them against contact with irritants. Since antitrypsin deficiency cannot be reliably recognized by any other means, it is advocated that all patients with chronic obstructive lung disease undergo an antitrypsin assay. (Auth. Abs. Mod.)

71-0870. Passey, R. D., Blackmore, M., Warbrick-Smith, D., Jones, R. **Smoking Risks of Different Tobaccos.** *British Medical Journal* 4(5781):198-201, October 23, 1971.

Experiments are reviewed which show that rats exposed to the smoke of English cigarette tobacco (flue-cured) had greatly shortened lives and damaged respiratory systems, while animals exposed to the smoke of cigar and Burley tobacco (air-cured) had no detectable respiratory disease. These differences are attributed to the methods of curing the tobaccos.

71-0871. Penman, R. W. **Conference on Pneumoconiosis. A Summary of the Conclusions From an International Conference on Coal Workers' Pneumoconiosis.** *American Review of Respiratory Disease* 102(2):243-247, August 1970.

This report summarizes the major conclusions from a conference on coal workers' pneumoconiosis held at Cumberland Falls, Kentucky, September 10-12, 1969. The objectives of the conference were to consider present knowledge of the medical aspects of coal workers' pneumoconiosis, to summarize points of agreement concerning certain key questions, and to formulate recommendations for further research with regard to problems where no agreement could be reached because of conflicting or inadequate data. The "Synopsis of the Work Session Proceedings" was processed in a previous Bulletin. *See* Abstract 71-0093.

71-0872. Perlman, L. V., Higgins, M. W., Chiang, B. N., Ostrander, L. D. (Jr.), Keller, J. B. **Electrocardiographic**

Patterns in Persons With Bronchitis and Without Bronchitis in Tecumseh. *American Review of Respiratory Disease* 104(3):443-447, September 1971.

Electrocardiographic (ECG) differences between patients with bronchitis (95 men and 51 women) and those without bronchitis (95 men and 51 women) were compared as part of the Tecumseh Community Health Study. Men with bronchitis had significantly faster heart rates and greater mean P wave amplitudes and durations than men without bronchitis; there were no differences among women with and without bronchitis. Differences in QRS complexes between bronchitics and nonbronchitics were not significant among men and women. Chronic bronchitis and ECG changes were associated with ventilatory defect and the lowest FEV_1 scores were found in men with chronic bronchitis and abnormal ECGs. There were more cigarette smokers among bronchitics than nonbronchitics. Smoking habits of men with ECG changes were not different from those of other men in the same diagnostic class. Among women bronchitics, all those with ECG changes were cigarette smokers whereas only two thirds of those without such changes were smokers.

71-0873. Reichel, G., Ulmer, W. T., Ikonomides, S. Z. **Influence of Smoking Habits on the Incidence of Non-specific Respiratory Diseases. III. Communication.** Complete English translation of "Einflusse der Rauchergewolnheiten auf die Haufigkeit unspezifischer Atemwegserkrankungen. III. Mitteilung," *Internationales Archiv fur Arbeitsmedizin* 27(1/2):49-72, October 30, 1970.

See Abstract 71-0096.

71-0874. Rode, A., Shephard R. J. **The Influence of Cigarette Smoking Upon the Oxygen Cost of Breathing in Near-Maximal Exercise.** *Medicine and Science in Sports* 3(2):51-55, Summer 1971.

The oxygen cost of hyperventilation was measured in 6 habitual smokers immediately following the smoking of two cigarettes. Observations were repeated after one day of deliberate abstinence from tobacco. There was a 13-79 percent decrease in the oxygen cost of breathing during the periods of abstinence, but in the three heaviest smokers the cost of unit ventilation was still greater than previously reported values for nonsmokers. The oxygen usage of the respiratory muscles made a significant demand upon oxygen transport mechanisms during exercise at a nominal 80 percent of aerobic power; in the heaviest smoker (age 46, smoking 20-30 cigarettes per day for 27 years), the oxygen cost of breathing accounted for 14 percent of aerobic power in "smoking" runs and 9 percent in "non-smoking" runs. Abstinence from cigarettes had other beneficial effects upon the cardiorespiratory response to exercise; these included a slowing of heart rate (9-12 beats/minute) and a decrease of expiratory minute volume. The subjects also sweated less, and found it easier to exercise at a given work load. (Auth. Abs.)

71-0875. Rulliere, R., Saigot, T. **Tabac et Poumons. [Tobacco and Lungs.]** *Vie Medicale* 52(25):3009-3017, July 1971, French.

Chronic bronchopneumopathy and bronchial cancer are discussed based on a review of recent experimental studies. The effects of smoke on the vibratile cilia of the bronchial mucosa, the effects of smoke on bronchial motoricity, and the irritating agents responsible for its harmful effects are presented, indicating that acetaldehyde and acrolein are the most toxic substances affecting ciliary function. Several of the factors which influence the frequency of bronchial symptomatology are discussed: the total quantity of cigarettes smoked, the average daily consumption, and the duration of the smoking habit. In addition, statistical, histological, chemical, and experimental evidence which indicates a causal relationship between tobacco and bronchial cancer is outlined.

71-0876. Ryder, R. C., Dunnill, M. S., Anderson, J. A. **A Quantitative Study of Bronchial Mucous Gland Volume, Emphysema and Smoking in a Necropsy Population.** *Journal of Pathology* 104(1):59-71, January 1971.

The percentage volume of bronchial mucous glands and the volume of pulmonary emphysema have been estimated by the point-counting technique in 353 lungs. This series comprised 178 females and 175 males, aged between 22 and 95 years. In 179 cases a smoking history was available; there were 106 smokers and 73 nonsmokers. The mean percentage volume of bronchial mucous glands was significantly greater in smokers than in nonsmokers. It was also greater in males than in females taken over the whole series, probably because of the higher proportion of female nonsmokers. There was no significant difference between the mucous gland volume in male and female smokers or between male and female nonsmokers. There was a very striking difference, significant in both males and females, in both the incidence and severity of emphysema in smokers compared with nonsmokers. In smokers emphysema occurred at an earlier age, and the severity of the disease increased markedly with age, possible due to longer exposure to tobacco. The incidence of emphysema remained fairly constant between 50 and 90 years. Emphysema in the smoker's lung was predominantly of the centrilobular type. The mean percentage bronchial mucous gland volume was significantly greater in those cases with emphysema (18.3) than in those without (14.8). However, there was no simple linear relation between the bronchial mucous gland volume and the volume of emphysema. This adds substance to the view that centrilobular emphysema and mucous gland hypertrophy are two states influenced by a common etiological agent rather than that they have any direct relation. These findings support the view that tobacco smoking is of prime etiological importance in the development of emphysema, particularly of the centrilobular variety, whereas its effect on mucous gland enlargement is surprisingly small. (Auth. Abs.)

71-0877. Shimada, H. **Haigan, Toku ni Sono Hassei ni Kansuru 2, 3 no Shiken. [Some Viewpoints on Lung**

Cancer, Particularly Its Pathogenesis.] *Journal of the Medical Society of Toho University* 17(1):8-12, February 1970, Japanese.

Chronic inflammation of the broncho-alveolar system and localized or diffused fibrosis of the lung often produce a conducive background for pulmonary cancer in man. Chronic bronchitis and pulmonary fibrosis caused by smoking and air pollution are considered to be conditions leading to the development of lung cancer in humans.

71-0878. Ulmer, W. T., Reichel, G. **A Contribution to the Epidemiology of Chronic Bronchitis and to Its Relation to Air Pollution.** Complete English translation of "Zur Epidemiologie der chronischen Bronchitis und deren Zusammenhang mit der Luftverschmutzung," *Deutsche Medizinische Wochenschrift* 95(51):2549-2554, December 18, 1970.

See Abstract 71-0103.

71-0879. Valdez Ochoa, S., Naranjo, F., Diaz, G. S. **Simposio Sobre Problemas Medicos Originados por el Tabaquismo. I. Alteraciones del Aparato Respiratorio. [Symposium on Medical Problems Originating in Tobaccoism. I. Alterations of the Respiratory System.]** *Neumologia y Cirugia de Torax* 32(1):3-13, January-February 1971, Spanish.

The irritating effect of tobacco smoke on the respiratory organs was studied in 100 cases of chronic bronchitis and pulmonary emphysema. The sample consisted of 73 men and 27 women, most of whom were over 50 years of age. Of the 70 smokers, 60 were determined to be heavy smokers. A direct correlation was found between severity of the diseases and intensity of smoking habits. Exacerbations of chronic bronchitis and emphysema were more frequent among cigarette smokers. Respiratory function tests indicated that respiratory insufficiency was more severe in chronic smokers who also showed carbon dioxide retention and in some instances, respiratory acidosis. A second study of 170 patients with bronchogenic carcinoma also indicated that undifferentiated and epidermoid carcinoma predominated in heavy smokers, while adenocarcinoma were more frequent in nonsmokers and moderate smokers.

71-0880. Van Ganse, W. **De Epidemiologie van CARA: Probleemstelling en Studiemethodes. [The Epidemiology of Chronic Nonspecific Respiratory Disease: The Problem and Methods of Studying It.]** *Archives Belges de Medecine Sociale Hygiene, Medecine du Travail et Medecine Legale* 27:375-387, June 1969, Dutch.

Examination of large populations by standard questionnaire and by simple lung function tests has contributed to the evaluation of the frequency (prevalence and incidence) of chronic nonspecific respiratory disease (CNRD), to the quantification of certain causal factors and to a better knowledge of the natural history of this group of diseases. One can estimate that in the European countries one man in three above the age of forty presents some symptoms of CNRD. The most important exogenous cause in adults is cigarette smoking. Air pollution alone, particularly in children, can contribute to the development of CNRD. Bacterial and viral infections of the respiratory tract are probably not important as primary factors but as causes of complications. The pursuit of epidemiological investigations remains indispensible because the techniques of present studies do not permit the detection of the very first, and possibly still reversible functional and morphological alterations, and because the complex interrelation of causal factors can only be clarified by sufficiently long studies on large numbers of subjects.

71-0881. Vidal, J., Cazal, P., Robinet-Levy, M., Michel, F.-B. **Bronchopneumopathies Chroniques Familiales et Deficit Homozygote en Alpha$_1$-Antitrypsine. [Chronic Familial Bronchopneumopathies and Homozygotic Alpha$_1$-Antitrypsin Deficiency.]** *Poumon et le Coeur* 27(1):79-94, 1971, French.

Six cases of homozygotic alpha$_1$-antitrypsin deficiency were studied. In the first two cases, which were of the PiZZ phenotype, the deficiency was associated with panlobular emphysema in young subjects. Three other cases corresponded to the PiSS phenotype. Of these, two had family histories of chronic bronchopulmonary disease, and the third was a healthy subject. The final case studied was of the PiIS type of deficiency and had emphysema. These six cases resulted from about 350 investigations. It is suggested that alpha$_1$-antitrypsin deficiency constitutes an etiological factor in respiratory diseases, and although the mechanism of action is not yet precisely known, it is definitely a factor to be considered among others. A direct relationship was found between respiratory problems and tobacco consumption. Furthermore, the presence of respiratory problems in the control group was less than for the relatives of the patients studied. This difference was particularly marked in men and in women who did not smoke.

See also **71-0899, 71-0901**

CARDIOVASCULAR DISEASES

71-0882. Asano, M. **Bisai Junkan to Kitsuen. [Microcirculation and Smoking.]** *Igaku no Ayumi* 77(2):65-72, 1971, Japanese.

A review is presented with particular emphasis on the author's recent work in collaboration with Branemark on the use of microphotoelectric plethysmography to study effects of smoking on human microcirculation.

71-0883. Bhagat, B., Ruehl, A., Rao, P., Rana, M. W., Hughes, M. J. **Effect of Cigarette Smoke on the Cardiovascular System in Dogs.** *Proceedings of the Society for Experimental Biology and Medicine* 137(3):969-972, July 1971.

A study of the effect of inhalation of cigarette smoke on the hemodynamics of the dog is reported. Various known pharmacological agents, such as tyramine, propranolol, chlorisondamine, and nicotine, were used to modify the response to tobacco smoke in an attempt to gain insight into the mechanism involved in that effect. It was concluded that the reduction in aortic blood pressure during smoking in anesthesized animals may be attributed in part to the central effects of nicotine and in part to the vasodilation caused by the action of released catecholamines on the peripheral beta-receptors.

71-0884. Boudik, F. **Srdecni Infarkt a Koureni. [Myocardial Infarction and Smoking.]** *Casopis Lekaru Ceskych* 110(26):614-620, July 25, 1971, Czech.

Data on myocardial infarction from the histories of 611 men ages 52-67 years from a total number of 8292 examined were assessed in an epidemiological investigation. With regard to smoking before the onset of the disease (90.1 percent of ex-smokers stopped smoking only after they developed the disease), the prevalence of myocardial infarction was significantly higher in cigarette smokers than in nonsmokers. In subjects who smoked fewer than 24 cigarettes per day before the disease, there was a statistically significant difference in prevalence as compared with nonsmokers. In those who stopped smoking after the onset of the disease, the prevalence was statistically significantly higher as compared with nonsmokers.

71-0885. Ciswicka-Sznajderman, M., Sznajderman, M., Januszewicz, W., Dzierzykray-Rogalski, T., Prominska, E., Charzewski, J. **Badania Kliniczne i Metaboliczne Mezczyzn z Przebytm w Mlodym Wieku Zawalem Serca. [Clinical and Metabloic Studies in Men With Myocardial Infarction at Young Age.]** *Polski Tygodnik Lekarski* 26(31):1185-1188, August 2, 1971, Polish

Detailed clinical examinations and determinations of certain biochemical and anthropometric indices were carried out in 60 men with myocardial infarction occurring below the age of 45. The control group consisted of 120 subjects selected randomly from a similar population. The myocardial infarction group exhibited a significantly higher proportion of subjects with high-school education, irregular work hours, occupational stress and family history of coronary disease than the controls. The incidence of arterial hypertension, and serum cholesterol and triglycerides was higher in the patients than in the controls. A significantly higher proportion of cigarette smokers (97.6 percent) with a long history of this habit was found in the patients than in the controls (74.1 percent). The groups differed also in the distribution of ABO blood groups and in selected anthropometric indices. Certain factors contributing to earlier development of coronary artery disease are discussed. (Auth. Abs. Mod.)

71-0886. Comstock, G. W. **Fatal Arteriosclerotic Heart Disease, Water Hardness at Home, and Socioeconomic Characteristics.** *American Journal of Epidemiology* 94(1):1-10, July 1971.

Several reports have indicated an inverse correlation between the hardness of community water supplies and deaths from arteriosclerotic and degenerative heart disease. An unusual opportunity to look at this association in more detail arose in Washington County, Maryland. Drinking water sources there vary markedly in hardness, and a private census in 1963 made it possible to match cases and controls from the same defined population and to study a number of socioeconomic characteristics. During the next three years, there were 189 deaths attributed to arteriosclerotic and degenerative heart disease among white males aged 45 to 64 who could be identified in the census. For each case, two controls were randomly selected from the census lists and matched for race, sex and year of birth. Water samples were collected from the residences of cases and controls and examined for total hardness. No significant association of arteriosclerotic and degenerative heart disease deaths could be found with water hardness. Deaths from these causes were more common among persons of lower socioeconomic status, among cigarette smokers, and among persons who attended church infrequently. The proportion of fatal cases and controls who had ever smoked pipes was almost the same, while considerably fewer cases than expected had smoked cigars. The decreased risk of arteriosclerotic and degenerative heart diseases associated with cigar smoking was not related to cigarette smoking, since both smokers and nonsmokers of cigarettes had lower risks if they had ever smoked cigars. The risk of arteriosclerotic and degenerative heart disease for cigarette smokers was greater than for ex-smokers, was dose-related, and was most marked for those consuming more than two packs daily. Although water hardness is not likely to be a real risk factor for cardiovascular disease, the role of trace elements in home drinking water supplies should be investigated.

71-0887. Corre, F., Lellouch, J., Schwartz, D. **Smoking and Leucocyte-Counts. Results of an Epidemiological Survey.** *Lancet* 2(7725):632-634, September 18, 1971.

A study of 4264 men showed that the number of leucocytes is increased in cigarette, cigar, and pipe smokers, notably in those who inhale. The increase is about 30 percent for a heavy smoker who inhales, compared with a nonsmoker. Investigation of a subgroup of 483 men of the same population confirmed this finding and revealed that the increase was in granulocytes, lymphocytes, and monocytes. The differential leucocyte-count showed no real change. (Auth. Abs.)

71-0888. Finklea, J. F., Hasselblad, V., Riggan, W. B., Nelson, W. C., Hammer, D. I., Newill, V. A. **Cigarette Smoking and Hemagglutination Inhibition Response to Influenza After Natural Disease and Immunization.** *American Review of Respiratory Disease* 104(3):368-376, September 1971.

Vaccination, illness, and smoking history were compiled for a young adult male population. The relationship of cigarette smoking to hemagglutination inhibition antibody response after exposure to a new antigen was assessed in serum specimens collected from 289 volunteers after the 1968 A_2/Hong Kong/68 influenza epidemic. Titers were minimally increased among smokers who were sick compared with those of nonsmokers. Among smokers who remained well, titers were significantly increased, probably because of more frequent subclinical infection. The persistence of hemagglutination inhibition antibody after natural infection or vaccination with A_2 antigens was significantly decreased among cigarette smokers, as were titers two weeks after vaccination. Serologic response to vaccination did not significantly differ between smoking groups. Smoking, vaccine history, and morbidity status during an influenza epidemic were significant factors in explaining variations in hemagglutination inhibition antibody titers. (Auth. Abs.)

71-0889. French, J. E. **Atherogenesis and Thrombosis.** *Seminars in Hematology* 8(1):84-94, January 1971.

The evidence indicates that thrombosis can contribute to the formation of atherosclerotic lesions at all stages of their development and emphasizes the crucial role of the blood platelets. The evidence that microthrombi can initiate the lesion is the least substantial but this in no way detracts from the undoubted importance of mural and occlusive thrombosis in the later stages of the disease. A consideration of the role of thrombosis in atherogenesis does not preclude the importance of other atherogenic mechanisms. Thus, mechanical factors are important in the localization of surface deposits, metabolic changes within the arterial wall modify the composition of the deposited material while the filtration mechanisms, operating at all stages of the disease, can add plasma constituents to the composition of the plaque. Some of the so-called risk factors, which have been shown by epidemiological studies to have predictive value in relation to the onset of ischemic heart disease, may be operating through the thrombotic mechanism. Hypercholesterolemia or other forms of hyperlipidemia, which in turn reflect dietary habits or endocrine imbalance, may affect the tendency to thrombosis through the effect of plasma lipids on blood coagulation, platelet properties or the fibrinolytic mechanism. There is evidence that cigarette smoking can affect platelet behavior and will shorten the thrombus formation time in an artificial system. Catecholamines released suddenly into the blood can potentiate both platelet aggregation and blood coagulation and might therefore be a factor in the increase in the disease which is attributed to psychological stress. The benefits of physical activity may be related to more effective fibrinolysis or to better collateral development which enables the individual to compensate better for the various thrombotic events.

71-0890. Gross, W., Bialek, R., Schade, G., Juchems R. **Changes of the Serum Lipids Due to Smoking.** Complete English translation of "Serumlipid-Veranderungen beim Rauchen," *Deutsches Medizinisches Journal* 21(6):368-374, March 20, 1970.

See Abstract 70-0636.

71-0891. Hagerup, L. **Tobaksrygning og Koronare Risikofaktorer. Fra 50 Ars Undersogelsen i Glostrup. [Tobacco Smoking and the Risks of Coronary Disease. From a 50-Year Study in Glostrup.]** *Ugeskrift for Laeger* 133(27):1309-1313, July 9, 1971, Danish.

The incidence of the so-called coronary risk factors in relation to tobacco smoking was investigated in 50-year-olds (436 males and 366 females) in Glostrup. No constitutional differences were found between nonsmokers, ex-smokers and smokers, but significantly less skin-fold thickness was encountered in smokers of both sexes. As assessed by serum creatinine, a relationship was found between smoking and renal funtion. However, no relationship was found between smoking and cholesterol or serum triglyceride. An association was demonstrated between the resting pulse and smoking as increased cigarette smoking resulted in increased resting pulse in males and lowered resting pulse in females. This association was connected with the relationship between smoking and increases in hemoglobin and hematocrit which may result in alterations in the viscosity of the blood. This is of significance for tissue circulation and thus for cardiac function. The effect of smoking on the heart was demonstrated by increased incidence of angina pectoris in smokers whereas ST alterations in the ECG at rest and after exertion were not more frequent in smokers than in nonsmokers. The role played by smoking in the pathogenesis of arteriosclerosis has not yet been elucidated. Its combination with other risk factors is presumed to be of significance for the prognosis of arteriosclerotic conditions.

71-0892. Horwitz, O., Long, E. T., Malamed, M., Taylor, N. **Results of Screening Patients for Peripheral Vascular Disease by Paramedical Personnel.** *Transactions of the American Clinical and Climatological Association* 83:218-226, October 26, 1970.

A method is described for screening a large number of subjects in a short period of time for the presence of peripheral vascular disease without the immediate presence of a physician. The judgment of trained paramedical personnel compares favorably with that of physicians in this small sphere of interest. Both arterial and venous insufficiency can be demonstrated at an early stage when prophylactic and often therapeutic measures can be most effective. It was observed that age is certainly a factor in arterial disease; nearly half of the positive results occurred in patients over 70 and nearly two thirds in patients over 60. A higher percentage of patients with arterial disease smoked. There was also a higher percentage of males than of females having peripheral arterial disease.

71-0893. Iglesias Leal, R., Caris, T. N., Lancaster, M. C. **Infarcto del Miocardio Silencioso y Atipico. [Silent and Atypical Myocardial Infarct.]** *Archivos del Instituto de Cardiologia de Mexico* 41(3):249-254, May-June 1971, Spanish.

In the School of Aerospace Medicine from 1959 to 1968, 520,000 electrocardiograms of members of the U.S. Air Force were analyzed. During this period, 42 cases of silent myocardial infarction and 44 cases of "atypical" infarction were detected and evaluated. The general group was comprised of subjects with a family background of heart disease, a high percentage of body fat, a heavy smoking habit, and a high incidence of predisposing diseases, such as diabetes mellitus and arterial hypertension. The clinical picture in the "atypical" group simulated diverse extracardial disorders; those attributable to the respiratory and digestive tract predominated. In 17 of the 86 patients, the electrocardiograms became normalized upon adoption of a program of controlled physical exercise, a low-fat diet weight reduction, suppression of tobacco and control of the associated diseases.

71-0894. Isager, H., Hagerup, L. **Tobaksrygning og Niveauerne for Haematokrit og Haemoglobin. Fra 50 Ars Undersogelsen i Glostrup. [Smoking and Hematocrit and Hemoglobin Levels. From a 50-Year Study in Glostrup.]** *Ugeskrift for Laeger* 133(27):1307-1309, July 9, 1971, Danish.

In a study of 394 men and 339 women, all aged 50, a positive correlation between cigarette consumption and hematocrit was found in both sexes. In women, a statistically significant correlation was also found between cigarette consumption and hemoglobin concentration. Hematocrit values above normal range were more common in cigarette smokers than in other kinds of smokers or nonsmokers. This difference was statistically significant in males. A statistically significant negative correlation between cigarette consumption and lung function (forced expiratory volume in one second) was found, but there was no evidence of any relationship between lung function and hematological variables. From these results it was concluded that the association between cigarette smoking and hematological variables is probably not secondary to the relationship between cigarette consumption and lung function. (Auth. Abs. Mod.)

71-0895. Jan, F., Grosgogeat, Y. **Tabac et Coronaires. [Tobacco and Coronary Disease.]** *Vie Medicale* 52(25):3019-3026, July 1971, French.

Epidemiological and experimental findings which indicate a relationship between tobacco and coronary diseases are reviewed. The effects of smoking on blood flow, cardiac rhythm, and on electrocardiographic results are described. Tobacco represents an important risk factor in coronary disease. Although the physiopathological mechanisms are not yet clear, and the long-term effects of the use of tobacco need further investigation, there is sufficient indication from present knowledge to recommend total abstention from tobacco in all those having coronary atherosclerosis.

71-0896. Koidakis, A. **Ai Skhesis tou Kapismatos Pros tiv Artiriosklirotikiv Aggiakiv Iosou. [Tobacco Smoking and Atherosclerotic Vascular Disease.]** *Iatriki* 19(2):169-182, February 1971, Greek.

The effects of smoking in coronary heart disease and occlusive peripheral arterial disease are reviewed. The greater part of the epidemiological and pathological investigations point to evidence that smoking is associated on the one hand, with an increased incidence of coronary heart disease and sudden death, and on the other, with occlusive peripheral arterial disease of atherosclerotic or other origin. The physiological effects of smoking on the cardiovascular system as well as its probable relationship to the development of atherosclerosis and coronary heart disease are discussed. In particular, the effect of nicotine on the sympathetic nervous system and the release of catecholamines, on lipid metabolism, platelet aggregation, and blood coagulation mechanism are discussed. Also studied is the hypothesis that smoking affects the smoker's personality and behavior. Finally, the opinions of many investigators who believe that smoking has dangerous effects especially in persons who have clinical manifestations of coronary atherosclerosis are quoted. (Auth. Abs. Mod.)

71-0897. Lilis, R., Teculescu, D., Roventa, A., Ionescu, S., Cristescu, I. **Cercetari Epidemiologice Privind Cardiopatia Ischemica in Industrie. Studiul Unui Grup cu Efort Fizic Minim (Ingineri, Tehnicieni, Proiectanti). [Epidemiological Investigations on Ischemic Cardiopathy in Industry. Study of a Group Involving Minimal Physical Work (Engineers, Technicians, Designers).]** *Medicina Interna* 23(3):273-291, March 1971, Rumanian.

The study included a group of 295 employees of a machine building plant, whose activity was prevalently sedentary (engineers, technicians, designers). The same methods were used as in a previous study including two groups of employees with a different level of work: 286 forgers and rolling mill workers (heavy work) and 119 milling machine and lathe operators (light work). The mean values of total cholesterol and triglycerides did not significantly differ in the group of technicians from those found in the "light work" operatives; the differences were, however, statistically different in comparison with the "heavy work" operatives. The beta/alpha-lipoprotein ratio had in general higher values among the technicians than in the "heavy work" employees. The incidence of angina pectoris among the technicians (4.7 percent) did not differ significantly from that of the "light work" operatives (4.2 percent), but was significantly higher than in the "heavy work" operatives (2.2 percent). The proportion of nonsmokers was greater in the technicians group than in the "light-work" operatives. The Master test was more frequently positive among the technicians (4.2 percent) than in the "heavy work" operatives (1.6 percent). The difference was not significant between the technicians and the "light work" group. The results show the unfavorable effect of reducing occupational physical work upon cholesterolemia and triglyceridemia levels, as well as upon the incidence of angina pectoris and positive Master test, significantly higher among the subjects whose activity is characterized by reduced physical work. The absence of significant differences of the risk factors studied and prevalence of ischemic cardiopathy between the "light work" operatives and the engineers and technicians is of particular interest bearing in mind the steady decrease in the load of physical work in most occupations in modern industry. The preventive measures necessary for controlling the unfavorable effects of a low physical activity in industrial employees are emphasized. (Auth. Abs. Mod.)

71-0898. Mathiesen, F. R., Larsen, E. E., Wulff, M. R. **Arterial Insufficiency in the Legs. I. A Clinical Statistical Analysis.** *Acta Chirurgica Scandinavica* 136:477-481, 1970.

A statistical analysis was made of those factors which may modify the clinical symptoms of ischemia in 333 patients suffering from arteriosclerosis of the legs. There was a relatively high incidence in ischemic ulceration in patients over 65 years of age, in patients with a short history of symptoms, in diabetic and hypertensive patients, and in patients with relative anemia, while patients with a familial history of arterial disease showed a low incidence of ulcer. Sex and smoking habits of the patients did not influence the distribution of the symptoms. Age, length of symptoms, diabetes, hypertension, sex, hemoglobin percent and smoking habits did not effect the localization of the ulcers. A long history of symptoms was combined with a relatively high incidence of bilateral symptoms, while age, diabetes, hemoglobin percent, sex, family history of arterial disease and smoking habits had no certain effects. Nineteen percent of the investigated extremities were presented by patients who did not smoke.

71-0899. Miller, G. J., Serjeant G. R. **An Assessment of Lung Volumes and Gas Transfer in Sickle-Cell Anaemia.** *Thorax* 26:309-315, May 1971.

Lung volumes, gas transfer, and anthropometry were assessed in sickle-cell anemia in 13 patients with previous pulmonary episodes and 12 without this history. Respiratory symptoms were assessed with a standard questionnaire, total lung capacity and its subdivisions, the carbon monoxide transfer factor (TF), diffusion capacity of the alveolar capillary membrane (Dm), and the alveolar capillary blood volume (Vc) were measured, and stature, sitting height and chest diameters were recorded. Total lung capacity and vital capacity were reduced because the thorax was small relative to body size in these patients. TF was reduced by anemia, small lungs, and a low Dm which was not simply a consequence of small lungs. This reduction tended to be offset by an increase in Vc. The cause of the reduction in Dm above that due to small lungs was probably located in the pulmonary circulation. Anemia was considered unlikely to be responsible, and although a difference between the reactivity of carbon monoxide with Hb A and Hb S may have contributed to the reduction in Dm and the increase in Vc, it was thought unlikely to be the only cause: Dm was significantly lower in patients with a history of pulmonary complications and in nonsmokers than in those without this history and in smokers. Alveolar capillary collapse or occlusion may also have reduced Dm in sickle-cell anemia and accounted for the greater reductions in those with previous pulmonary episodes and in nonsmokers. (Auth. Abs.)

71-0900. Nieveen, J., Doorenbos, H., Chappin, J.J.M.L., Hartman, L. A., May, J. F., Temmem-Brak, T. M., Visser J.W.E., Wall, E.v.d., Wouda, A. A. **Risicofactoren Voor Coronaire Hartziekten bij Jonge Managers. [Coronary Disease Risk Factors in Young Managers.]** *Nederlands Tijdschrift Voor Geneeskunde* 115(32):1332-1337, August 7, 1971, Dutch.

The risk factors of coronary disease were assessed on the basis of an enquiry among 605 young managers between 30 and 40 years and of an extensive examination of a group of 36 of these persons. Factors such as lack of exercise, smoking and obesity were encountered in a high percentage of those examined. Carbohydrate tolerance and lipid levels were also abnormal in a surpisingly large proportion of the group subjected to extensive examination, whereas electrocardiogram (ECG), vectorcardiogram and telemetric examination revealed disorders in only a small proportion. Emphasis is laid on the importance of preventing coronary disease and advising more exercise, no smoking, fewer calories (especially less saturated fatty acids and sugar), adequate treatment of predisposing diseases such as hypercholesterolemia, hypertension, diabetes, etc. The question is raised whether a population study using ECG examinations exclusively has any value if carbohydrate tolerance tests and lipid fraction tests are not made at the same time. Even if these more elaborate examinations were to be performed, it remains doubtful whether the effects, although somewhat more direct and personal, would be of much more value than continued emphasis on the well-known and generally recommended measures (to say nothing of the danger of provoking anxiety complexes in unsuspecting people). Prevention based on general advice (especially through parents and educators) and on economic measures (diet, tobacco, etc.) is of even greater importance than adequate treatment and rehabilitation of persons already suffering from coronary disease. (Auth. Abs. Mod.)

71-0901. Parade, D. **Cor Pulmonale and Smoking.** Complete English translation of "Cor Pulmonale und Rauchen," *Medizinische Klinik* 64(2):80-84, January 10, 1969.

Nicotine abuse in the development of cor pulmonale was investigated in 177 patients (135 men, 42 women) with EKG signs of right overloading. Twenty-nine patients showed clinically significant signs of a chronic bronchitis with emphysema. Smokers were relatively more numerous in this group. The development of cor pulmonale can have different causes with bronchial asthma, lung emphysema as well as further parenchymal and vascular changes being very important in this respect. Chronic nicotine abuse plays an important role herein. Inhalation of tobacco smoke in nonindustrial areas is the most important factor, as compared with other forms of air pollution, in the development of cor pulmonale. A relatively high coincidence of an obstructive bronchitis with a peptic ulcer was observed. The number of smokers with peptic ulcer showing EKG indications of right overloading of the heart was also relatively high.

71-0902. Paras Chavero, E., Mercado, E., Quintero, A. **Simposio Sobre Problemas Medicos Originados por el Tabaquismo. II. Alteraciones Cardiovascular. [Symposium on Medical Problems Originating in Tobaccoism. II. Cardiovascular Alterations.]** *Neumologia y Cirugia de Torax* 32(1):15-18, January-February 1971, Spanish.

In a group of 106 men with myocardial infarction, the relationship of smoking and coronary disease was investigated. Thirteen percent of the patients were nonsmokers. The only difference observed between the nonsmoker and the moderate smoker (less than 20 cigarettes per day) and the heavy smoker was the degree of pulmonary emphysema: 28 percent for the nonsmoker, and up to 75 percent for the heavy smoker. Mortality in acute myocardial infarction was 16 percent for thy heavy smoker and 7.8 percent for the moderate smoker and nonsmoker. Survival after three years following the first attack was 12 percent lower for the heavy smoker than for the moderate smoker. Although the patients were repeatedly warned of the danger of continued smoking after myocardial infarction, 50 percent of the heavy smokers continued their habit. The risk of a second infarction differs greatly if the patient stops smoking. In smokers, 32.4 percent suffer a second infarction within three years, as compared with 15.6 percent in nonsmokers.

71-0903. Prerovska, I., Drdkova, S. **Der Einfluss der chronischen Einwirkung von Kohlenoxyd auf den klinischen Zustand und biochemische Veranderungen im Serum exponierter Personen in Hinsicht auf die vorzeitige Entwicklung der Atherosklerose. [Influence of Chronic Effect of Carbon Monoxide on Clinical State and Biological Changes in the Serum of Exposed Persons With Respect to Precocious Development of Atherosclerosis.** *Internationales Archiv fur Arbeitsmedizin* 28(2):175-188, 1971, German.

In 1964 a group of 50 workers (40 carbonization workers of a chemical plant and 10 gas main workers), age 20 to 40 years was examined, together with an equally large control group. The values of carbon monoxide in the atmosphere varied, in some cases measuring up to 0.1 volume percent, while the level of carboxyhemoglobin in the blood was between 2-26 percent. The exposure lasted 10.5 years on the average. Internal examination supplemented by blood pressure, EKG, examination of the fundus of the eye and determination of serum lipids did not show any deviations suggesting early development of atherosclerosis in the exposed workers. In 1970 both groups were checked in the same way. During the six-year interval, the degree of exposure had not changed. Of the original group of 50 persons 37 workers, 32-48 years of age, had continued working in the hazardous environments, the exposure lasting an average of 17.5 years. With the exception of two nonsmokers, the exposed persons smoked from 15 to 40 cigarettes daily. The clinical condition of the workers of the hazardous environments did not show any earlier or more substantial arteriosclerotic changes than the population of similar age span. The average values of serum lipids did not exceed the normal range. It is concluded that under the conditions present in these places of work the chronic exposure to carbon monoxide does not represent a primary etiological factor in the development of sclerotic changes of the vessels, but that in persons with sclerotic vessels, the increase of anoxia associated with a higher exposure to carbon monoxide might lead to more serious changes of the organs.

71-0904. Reimer, E. E., Tiso, B. **Der Myokardinfarkt. Vergleichende klinische und therapeutische Ergebnisse. [Myocardial Infarct. Comparative Clinical and Therapeutic Results.]** *Weiner Zeitschrift fur Innere Medizin und ihre Grenzgebiete* 52(7):330-350, 1971, German.

From the middle of 1963, until the end of 1969, a total of 729 patients suffering from myocardial infarct, were hospitalized. The experience gained from 280 patients between 1963 and 1966 was compared with that gained for 449 patients with myocardial infarct during the period 1967–1969. Up to 1966 a considerable number of authors reported an increase in the number of patients with myocardial infarct and of myocardial infarct fatal cases, there have been no reports of any noticeable increase since then, a fact which is also confirmed by Austrian health reports. The percentage of myocardial infarct compared with the total number of patients in the Kaiser Franz Joseph Hospital in Vienna was between 7.7 and 10 percent during the past few years. Among these, a considerable rise in the number of female and young patients was observed. The concurrence of risk factors such as obesity, hypertension, diabetes mellitus and hyperlipemia are very important in this connection. Among the younger patients added risk factors are nicotine abuse, stress and focal damage. The percentage of smokers dropped from 62 percent in the 1963-1966 group to 46 percent in the later group. The percentage of occlusive arteriopathies among infarct patients is twice as high as in a similar group with intact arteries. About 74 percent of the patients in the obliterating arteriopathies group are smokers. Recent therapeutic techniques for myocardial infarct are also discussed. It is estimated that total mortality can be reduced to 23 percent. Excluding patients who are already dead on arrival or prior to the installation of efficient therapeutic techniques, the mortality rate is as low as 12.9 percent.

71-0905. Russek, H. I. **'Progress' in the Treatment and Prevention of Coronary Heart Disease.** *American Family Physician* 4(3):68-74, September 1971.

Various alternatives available to the physician in the drug therapy of ischemic heart disease, particularly in alleviating the symptoms and disability and in controlling the underlying atherosclerotic process of the disease, are described. Despite significant advances in the treatment of angina pectoris and myocardial infarction, it appears that the overall morbidity and mortality from ischemic heart disease has not been appreciably altered in the U.S. in the past two decades. Evidence indicates that a high-fat diet and stressful living form a lethal combination starting early in life. The statistical evidence linking smoking to coronary heart disease may reflect the importance of stress rather than cigarettes per se. This is borne out by the fact that physicians, who as a group have practiced greater tobacco abstinence than any other group within the general population, appear to die at the same average

age as before this abstinence trend began. Alterations in diet, physical training and environmental relaxation could prove effective prophylactically only if instituted early in childhood and maintained as a lifetime practice.

71-0906. Sartwell, P. E. **Oral Contraceptives and Thromboembolism: A Further Report.** *American Journal of Epidemiology* 94(3):192-201, September 1971.

Additional findings from a case-control study of thromboembolism and oral contraceptives are presented. There was some association of smoking with recent use of orals, but no evidence that smoking enhanced their effect in producing clotting. Data on frequency of use of all contraceptive methods by cases and controls, according to age and religion, are presented. No evidence was found that other drugs taken by subjects enhanced the risk of thromboembolism. Some problems in the design of such studies are discussed. A probable difference in the use of oral contraceptives between those subjects who were interviewed and those who were not is shown. It is demonstrated that matching on factors associated with the dependent variable can produce a spurious decrease in relative risk when the data are pooled. (Auth. Abs.)

71-0907. Schwartz, D., Richard, J. L., Lellouch J., Claude, J. R. **Serum Lipids, Smoking and Body Build. Study of 7,972 Actively Employed Males.** *Revue Europeenne d'Etudes Cliniques et Biologiques* 16:529-536, 1971.

Cholesterol measurements were made in 7972 Parisian males; triglycerides were also measured in 1972 subjects chosen randomly from the same group. A significant relationship between triglycerides and smoking was found in the 25-29 age group and a moderate relationship in the 40-44 and 45-49 age groups. Although there was no significant association for the other age groups, the age-adjusted correlation between triglycerides and smoking over all age groups was highly significant. As for cholesterol, there exists, at least in subjects under 50, a weak relationship which is revealed particularly when body build is taken into account, because of opposite associations between body build and either cholesterol (a positive one) or smoking (a negative one). The fact that age and body build were usually not taken into account in studies reported in the literature could explain their apparent discrepancy with the results of the present study. The relationship between smoking and cholesterol and its possible disappearance over the age of 50 needs further investigation. The relationship is, in any case too weak for the increased risk of arterial diseases associated with smoking to be due to an increase in serum lipids.

71-0908. Stamler, J. **The Primary Prevention of Coronary Heart Disease.** *Hospital Practice* 6(9):49-61, September 1971.

In nearly all cases of coronary heart disease, the underlying process is severe atherosclerosis of the coronary arteries. Severe atherosclerosis is a metabolic disease of multiple causes in which altered lipid metabolism plays a crucial role. In terms of primary prevention, there are four risk factors in coronary heart disease that are amenable to control: habitual diet high in cholesterol and saturated fat, hypercholesterolemia, hypertension and cigarette smoking. In relation to smoking, exposure to carbon monoxide, in amounts akin to those inhaled by habitual smokers produced more severe lesions in animals fed an atherogenic diet than in controls fed only the harmful diet. However, the mechanisms involved in how smoking aggravates atherosclerosis remains unsolved. Whatever the mechanisms, epidemiological studies have shown that where a population has a high incidence of hypertension and cigarette smoking but its dietary pattern make hyperlipidemia infrequent, morbidity and mortality for myocardial infarct and other forms of coronary disease remain generally low. When all three risk factors are present they have a more than additive impact on coronary morbidity and mortality. Recommended primary preventive measures include dietary changes to prevent or control hyperlidemia, obesity, hypertension and diabetes; elimination of cigarette smoking; and pharmacologic control of elevated blood pressure.

71-0909. Teraslinna, P., Partanen, T., Koskela, A., Oja, P. **Association of Certain Social Habits and Attitudes With Risk Factors of Coronary Heart Disease.** *Social Science and Medicine* 5(3):243-250, June 1971.

A sample consisting of 1314 manager-executives was studied to determine whether certain personal habits, social attitudes and evaluations are associated with risk factors and estimated risk of coronary heart disease (CHD) in a cross-section of a male population relatively homogeneous in social class, status and occupation. The risk factors studied were systolic and diastolic blood pressures, serum cholesterol, and predicted maximal oxygen uptake. Personal habits and attitudes, determined by questionnaire, were: dissatisfaction with work and with family; insufficiency of sleep, leisure time and physical activity; and current frequency of cigarette smoking, alcohol use and evenings spent at home. Age-adjusted systolic blood pressure showed the highest correlation with infrequency of cigarette smoking. Frequencies of cigarette smoking and alcohol use formed the highest correlating combination with systolic blood pressure. However, the additional explained variance due to alcohol use was not significant. Diastolic blood pressure was relatively independent of the social variables, showing no significant correlation with any of them. Frequencies of cigarette smoking and alcohol use gave the highest correlating two-variable function with both age-adjusted serum cholesterol and CHD risk measure. Increased frequency in both cigarette smoking and alcohol consumption corresponded with increased values of serum cholesterol and CHD risk function. Maximal oxygen uptake was associated with frequency of physical activity.

See also **71-0806, 71-0807, 71-0826, 71-0832, 71-0843**

OTHER DISEASES AND CONDITIONS

71-0910. Hauser, G. A. **Genussmittel in der Schwangerschaft. [Voluptuaries in Pregnancy.]** *Therapeutische Umschau* 28(7):430-434, July 1971, German.

The effects of alcohol, tobacco and drugs on the human system, particularly in pregnancy, are briefly summarized. Alcohol-consuming women eat less, which can result in a vitamin deficiency and a possible protein deficiency in the mother. Passage of alcohol through the placenta can injure the fetus and passage through the milk of mother can also adversely affect the child. Tobacco smoke, through its chief constituent, nicotine, has a harmful effect on the neurovegetative system, with women more susceptible than men. Smoking during pregnancy leads to an increased incidence of premature births, hyperemesis, preeclampsia and disturbances of labor. Passage of nicotine through mother's milk results in a lower body weight of the nursing infant. Precise data on the effects of children of mothers under narcotics are lacking but some harmful consequences are noted.

71-0911. Henry, H. B. **Eustachian Tube Blocking: A Method of Treatment.** *Journal of the Louisiana State Medical Society* 123(8):286-288, August 1971.

A method of treating eustachian tube blocking which can be used in office practice and which gives uniformly good results is described. Patients are advised to stop smoking as part of the treatment since tobacco smoke or allergy to tobacco are felt to cause blocked ears and the associated symptoms of sinus trouble and postnasal drip. Other researchers believe that the tars and carbon monoxide from tobacco smoke are the irritating factors or that the smoke component has a ciliostatic effect leading to failure of the middle ear clearance. The vasomotor effect of nicotine and the local irritative effect of the smoke may also play roles.

71-0912. Khosla, T., Lowe, C. R. **Obesity and Smoking Habits.** *British Medical Journal* 4(5778):10-13, October 2, 1971.

A large-scale survey of steel workers in South Wales has shown a considerable difference between the body weights of smokers and of nonsmokers. The difference increases with age so that men over 40 years who have never smoked are on average 13 lb (5.9 kg) heavier than smokers. Even so, smokers are about 15 lb (6.8 kg) heavier than the weight standard considered desirable by the Metropolitan Life Insurance Company, while nonsmokers are nearly 30 lb (13.6 kg) heavier. About 20 percent of the men are attempting to give up the smoking habit. Ex-smokers who have given up smoking for more than eight years approach the body weight of men of the same age who have never smoked. (Auth. Abs. Mod.)

71-0913. Perales Goitia, M. G. **Simposio Sobre Problemas Medicos Originados por el Tabaquismo. IV. Alteraciones Morfologicas en Diferentes Organos y Sistemas. [Symposium on Medical Problems Originating in Tobaccoism. IV. Morphological Alterations in Various Organs and Systems.]** *Neumologia y Cirugia de Torax* 32(1):27-29, January-February 1971, Spanish.

A review of several studies on morphological alterations related to smoking is presented. Severe atherosclerosis is more frequent in smokers (45.9 percent) than in nonsmokers (15.3 percent). In the esophagus, clear changes were observed in smokers as compared to nonsmokers. Perhaps pulmonary emphysema has a causal relationship with gastric and peptic ulcers and both conditions are in turn affected by smoking. Changes found in the respiratory tract are much more frequent in smokers. There is increasing evidence of the association of tobacco smoking and bronchogenic carcinoma.

71-0914. Richardson, J. F. **The Dietary Sugar Intake of Businessmen; the Results of a Cross-Sectional Survey.** *Postgraduate Medical Journal* (Supplement):423-426, June 1971.

Yudkin's questionnaire on the dietary intake of sugar was given to 415 businessmen for self-administration. A significant inverse relationship was found between the total sugar intake and relative weight in this group of middle-aged men. The mean sugar intake of current cigarette smokers was significantly higher than that of current non-cigarette smokers. This was due to the lower sugar intake of the ex-smokers, as there was no difference in mean sugar intake between current smokers and those who never smoked. Part of the variation may be attributed to the higher age of the ex-smokers and the higher percentage restricting their sugar intake. The results suggest that sugar intake of these subjects varies with time. Consequently, longitudinal studies are indicated to elucidate the relationship between sugar intake and ischemic heart disease. Studies confined to those who state that they are not restricting their sugar intake may give misleading results.

71-0915. Rousset, J.-J., Lauvergeat, J.-A. **Protozoaires Buccaux. Enquete Epidemiologique. [Oral Protozoa. Epidemiologic Study.]** *Presse Medicale* 79(33):1495-1497, July 3, 1971, French.

The endemic occurrence of *Entamoeba gingivalis* and *Trichomonas tenax* in 250 young and apparently healthy adult males was investigated. The pathogenicity of *Trichomonas tenax* is discussed as one of the factors of alveolodontal pyorrhea. Special emphasis is given to the aggravations by gingival irritants, such as tobacco. Heavy smokers (over one pack per day) are notably more affected than nonsmokers: 20 percent to 5.2 percent flagellate protozoa present, respectively. Direct mouth to mouth contamination seems probable.

71-0916. Shaikh, M. I., Thompson, J. H., Aures, D. **Acute and Chronic Effects of Nicotine on Rat Gastric Secretion.** *Proceedings of the Western Pharmacology Society* 13:178-184, 1970.

Acute and chronic effects of smoking doses of nicotine on gastric juice volume, and acid and pepsin output were investigated in two-hour pylorus-ligated rats under basal conditions, and following stimulation with synthetic gastrin, ICI-50123. One hundred and seventy male Sprague-Dawley rats were chronically injected subcutaneously with saline or 100 micrograms of nicotine base/ml/kg in saline 3 times daily for 15 days. The pylorus was ligated and the following drugs were injected acutely during the two hours of collection: ICI-50123, 200 micrograms/kg/hour in saline; ICI-50123 control solution, 1 ml/kg/hour; nicotine and nicotine control solutions, similar to those used for the chronic injections. Results showed that in the case of acute nicotine exposure, low doses of the alkaloid produced varying depression of basal volume, and acid and pepsin output. Basal gastric secretion was stimulated by nicotine doses of about 150 micrograms/kg/hour, but depression was observed with higher doses. With ICI-50123-stimulated secretion, increasing doses of nicotine produced progressive reduction of gastric juice volume, acid output and pepsin output. Transient peaks were produced in all parameters with a dose of 100 micrograms/kg/hour. These peaks, although not greater than values obtained in controls (no nicotine), were higher than data from similar groups in the basal state, and thus reflect a true stimulant effect of nicotine. Chronic nicotine injections of 300 micrograms/kg/day for 15 days resulted in an increased basal gastric juice volume, and acid and pepsin output. Based on an average "smoking dose" of nicotine, this dose approximates the smoking of 3-5 cigarettes per day. Acute nicotine administration to rats chronically exposed to the alkaloid resulted in significant secretory inhibition, which could be overcome by sub-maximal doses of ICI-50123. The increase in acid output following chronic nicotine injections can be further increased by ICI-50123. Possible mechanisms of both acute and chronic nicotine-induced secretory changes are discussed.

71-0917. Waters, W. E. **Smoking and Neuroticism.** *British Journal of Preventive and Social Medicine* 25(3):162-164, August 1971.

A standard questionnaire, which was completed by 1,718 individuals (93.5 percent of the available sample) selected at random from the electoral roll asked about smoking habits and included questions from which a grade for neuroticism was obtained. The results suggested that, in women, smokers are more neurotic than nonsmokers, and there was a statistically significant correlation between the number of cigarettes smoked per day and the neurotic grade. (Auth. Abs.)

71-0918. Wilkinson, A. R., Johnston, D. **Inhibitory Effect of Cigarette Smoking on Gastric Secretion Stimulated by Pentagastrin in Man.** *Lancet* 2(7725):628-632, September 18, 1971.

Cigarette smoking produced significant inhibition of pentagastrin-stimulated gastric-acid secretion in normal volunteers and in patients with duodenal or gastric ulceration. Secretion of pepsin also diminished. Inhibition was more pronounced in normal subjects than in patients with ulcer. Intravenous infusion of nicotine acid tartrate produced inhibition of widely varying degree. One cigarette produced as much inhibition as did two cigarettes. Inhibition was as great in habitual smokers as in nonsmokers. The results suggest that smoking after a meal will reduce the gastric secretory response to the meal. The benefit derived from giving up smoking by patients with peptic ulcer is unlikely to be due to any decrease in acid secretion. On the contrary, giving up smoking might lead to an increase in gastric secretion. (Auth. Abs.)

See also **71-0842, 71-0855, 71-0861, 71-0907**

71-0919. Althoff, S. A., Nussel, E. J. **Social Class Trends in the Practices and Attitudes of College Students Regarding Sex, Smoking, Drinking, and the Use of Drugs.** *Journal of School Health* 41(7):390-394, September 1971.

A questionnaire survey of 1296 students at the University of Toledo, Ohio, was conducted during the academic year, 1969-1970, to compare the practices and attitudes of students of varying socioeconomic status in relation to sex, smoking, drinking and use of illegal drugs. A general social class trend was observed in the practices and attitudes of these college students regarding sexual permissiveness, smoking and drug usage. These practices and attitudes appeared to be liberal in the lowest class (less than $5000), most conservative in the lower middle class ($5000-9999), conservative in the middle class ($10,000-14,999), liberal in the upper middle class ($15,000-19,999) and most liberal in the upper class ($20,000 and over). Alcohol, on the other hand, was found to increase as socioeconomic status increased. The incidence of smoking was found to agree with the reported national average of 20-30 percent. The smallest percentage of smokers was in the lower middle class and the greatest percentage, exceeding the national average, was in upper middle and upper classes. As the number of parents who smoked increased with increase in social status, so did the number of students who smoked increase, with the exception of the lower middle class. However, the upper class most closely approximated parental smoking. Most of the students believed that smoking is harmful to health and the tendency to hold this belief increased as social class status increased. Cognitive dissonance was apparent in that approximately 87 percent of the upper class students believed smoking was harmful and yet 46 percent of them smoked.

71-0920. Biener, K. **Rauschgiftkonsum bei Rauchern und Nichtrauchern. [Consumption of Drugs by Smokers and Nonsmokers.]** *Praxis* 60(20):652-654, May 18, 1971, German.

In Bern (Switzerland), a total of 227 male grammar school students (28 percent smokers) have been investigated regarding their attitudes and usage of drugs. Twenty-three percent of the smokers and only three percent of the nonsmokers have already used a drug, usually hashish, at least once. Sixty-one percent of the smokers and thirty-six percent of the nonsmokers stated that they would like to try a drug. Two-thirds of the juveniles, smokers and nonsmokers alike, are in favor of a legal prohibition of the use of drugs; sixty-seven percent of the smokers and fifty-two percent of the nonsmokers favor legalization of the use of hashish. Arguments, pro and con, concerning the use of drugs are briefly summarized.

71-0921. Bresard, M., Grenier de Ruere. P. **Alimentation. Boisson. Tabac. Etude d'un Echantillon Representatif de 706 Hommes, Ages de 21 a 65 Ans, a Saint-Etienne. Chapitre VI. Alcool et Tabac. [Food. Drink. Tobacco. Study of a Representative Sample of 706 Men, 21 to 65 Years of Age, at Saint-Etienne. Chapter VI. Alcohol and Tobacco.]** *Bulletin de l'Institut National de la Sante et de la Recherche Medicale* 26(1):153-172 January-February 1971, French.

A very detailed study has been made of the smoking habits of 706 men in relation to alcohol consumption, food practices and certain sociological factors. Tables give breakdowns of smokers by age, matrimonial status, social level and alimentary practices particularly caloric, protein, lipid, sugar, calcium, and vitamin C intake. It is noted that in certain instances the emphasis on the harmful effects of smoking has been cited as the cause of alcoholic excesses. The present study (Chapter VI) is part of a fuller study dealing with the consumption of alcohol in Saint-Etienne.

71-0922. Cahoon, D. D. **Cigarette Addiction and Carbon Dioxide Inhalation: A Hypothesis.** *Psychological Record* 21(2):247-249, 1971.

It is hypothesized that chronic cigarette smoking may lead to a vicious circle of CO_2 depletion due to atypical breathing habits related to chronic smoke inhalation and exacerbated by the influence of nicotine, followed by a high CO_2 intake through cigarette smoke inhalation. CO_2 imbalance may be only one of the many variables possibly related to cigarette addiction, but if it is an important factor, its manipulation may help provide a smoking "cure."

71-0923. Cendron, H., Vallery-Masson, J. **Tabac et Comportement Sexuel Chez l'Homme. [Tobacco and Sexual Behavior of Men.]** *Vie Medicale* 52(25):3027-3030, July 1971, French.

A retrospective questionnaire survey of 70 men, ages 45 to 90, is reported which investigates if a relationship exists between cigarette smoking and sexual behavior in men between 25 and 40 years of age. Only those consuming one or more packs per day were considered as smokers while nonsmokers were those who had never smoked or smoked a maximum of five cigarettes per day. The men were placed in two groups according to whether the rhythm of monthly sexual activity had remained the same or decreased between the ages of 25 to 40. Sexual activity was found to decrease more frequently in smokers than in nonsmokers. Although a series of factors (age, health, marital status, morphological and psychological factors) must be considered in determining the importance of and motivation in sexual activity and the smoking habit, a prolonged action of a toxic agent such as tobacco can lead to a diminution of masculine sexuality.

71-0924. Cotten, D. J., Thomas, J. R., Stewart, D. **Immediate Effects of Cigarette Smoking on Simple Reaction Time of College Male Smokers.** *Perceptual and Motor Skills* 33(1):336, August 1971.

The immediate effects of smoking one cigarette on the simple reaction time of 15 college males was investigated. Before testing, each subject smoked 45 to 55 mm of an 85-mm non-filtered cigarette containing 29 mg tar and 1.5 mg nicotine. The test, in which the subject pressed a key when a light appeared, was administered before smoking, immediately after smoking and at intervals of 5, 15, 25, 40 and 55 minutes after smoking. The mean reaction times immediately following and 5 minutes after smoking were significantly slower than all other test intervals. The 40- and 55-minute intervals were significantly faster than the reaction time before smoking. Cigarette smoking impedes simple reaction time for a short period.

71-0925. Coudray, P. **Tabac et Comportement Sexuel Chez la Femme. [Tobacco and Sexual Behavior of Women.]** *Vie Medicale* 52(25):3031-3032, July 1971, French.

Two hypothetical and contrasting types of women are described. The first smokes believing it is fashionable to do so, does not inhale, and will usually let her cigarette consume itself in the ashtray. The second type smokes in an attempt to imitate a masculine habit: she smokes nonfilter cigarettes continually and inhales deeply. The psycho-sociological reasons for their behavior are analyzed. The desire to share a certain type of behavior with men or to ascertain her own femininity could be basic motivating factors in a woman's smoking habit.

71-0926. Egsmose, T., Stokholm, J., Egsmose, R. **Danske Laegers Vurdering af Tobakkens Skadevirkninger. [Awareness of Health Hazards of Tobacco Smoking Among Danish Doctors.]** *Ugeskrift for Laeger* 133(27):1321-1326, July 9, 1971, Danish.

Opinions of the medical profession in Denmark towards the association between tobacco smoking and health hazards were elicited along with reasons for discontinuing or contemplating stopping smoking. The random sample consisted of 977 or 13.2 percent of Danish doctors. As the reason for ceasing smoking or contemplating stopping of the habit, 52 percent reported protection of future health while 16 percent reported symptoms of disease. The latter reported respiratory disorders (37 percent), ischemic heart and vascular diseases (24 percent), and poor general health (11 percent). The most important health hazards which could be prevented by cessation of smoking were considered to be lung cancer in 52 percent, cardiac disease in 27 percent, chronic bronchitis in 14 percent and other diseases in 7 percent. A definite connection between smoking and lung cancer was considered to be proved by 78 percent of the doctors while the corresponding figures for chronic bronchitis and coronary thrombosis were 74 percent and 37 percent, respectively. One-fourth of the doctors who smoked frequently contemplated stopping, about half rarely did so and the remainder never considered it. Among the ex-smokers, 22 percent had not smoked for several years. The investigation showed a general trend among the younger doctors to regard tobacco smoking as a serious hazard to health.

71-0927. Geller, I., Hartmann, R., Blum, K. **Effects of Nicotine, Nicotine Monomethiodide, Lobeline, Chlordiazepoxide, Meprobamate and Caffeine on a Discrimination Task in Laboratory Rats.** *Psychopharmacologia* 20(4):355-365, 1971.

Hungry rats were trained on a discrimination task in order to obtain food rewards. During each experimental session, discrete stimuli of 1-minute duration were delivered through a small speaker in the experimental chamber at random intervals on the average of once every 2 minutes. Lever responses in the presence of a light and tone were correct and produced food rewards. Lever responses in the presence of the light stimulus were incorrect and were punished by total inactivation of the experimental chamber. Rats were selected for this experiment based on their inability to acquire the discrimination task even after six months of training. Administration of nicotine, lobeline, chlordiazepoxide and meprobamate produced an improvement in discrimination performance through a reduction of responses to incorrect stimuli. Caffeine and nicotine monomethiodide, the quaternary salt of nicotine, were without effect on the discrimination. (Auth. Abs.)

71-0928. Greenwald, P., Nelson, D., Greene, D. **Smoking Habits of Physicians and Their Wives.** *New York State Journal of Medicine* 71(17):2096-2098, September 1, 1971.

A questionnaire survey of 5 264 members of the Women's Auxiliary of the Medical Society of New York was undertaken to study the smoking habits of physicians and their wives. The over-all response rate was 81 percent. Results indicate that nearly two thirds of physicians and over 40 percent of their wives who had ever smoked have now stopped. Twenty-four percent of physicians and 36 percent of their wives are still smoking. In every age group except the oldest (65 or more years), more wives than physicians are smoking now. The largest numbers of smokers are in the youngest-age group (25 to 34 years). Men had a higher cigarette consumption than women; the median number of cigarettes smoked per day was 19 vs. 15 for women. About 1 in 5 of the women smokers and 1 in 3 of the men smoked more than one pack per day. Couples tended to have similar habits. Physicians who had never smoked tended to be married to women who also never smoked, former smokers were more commonly married to former smokers, and smokers were married to smokers. The smoking habits of physicians were not found to be related to medical specialty.

71-0929. Hasenfus, J. L. **Cigarettes and Health Education Among Young People.** *Journal of School Health* 41(7):372-376, September 1971.

Although 10 million adults in the U.S. have stopped smoking cigarettes in the past four years, smoking has increased among teenagers in every age level from 12 to 18. The methods used to educate children and youth regarding cigarette smoking are examined. There seems to be an increasing agreement that knowledge of the health hazards of smoking has little influence on the smoking behavior of youth unless the individual already has a good concept of how health relates to his pursuit of happiness and goals in life. If concepts of health can be made deeply felt and idealized by children, specific health teachings will be recognized by them as important. Foundational areas relating to the task of educating the young in health matters, especially cigarette smoking, are considered, including the views that smoking among youth is coping behavior to stresses in life, and that it is a result of a generation gap, especially as it pertains to communication.

71-0930. Hilton, D. D. **Access and Attitudes to Smoking. (Letter)** *British Medical Journal* 2(5757):337, May 8, 1971.

A survey of two secondary schools in Portsmouth, England, showed 70 percent of 105 boys aged 14 had tried smoking and one third were regular smokers, while 73 percent of 48 girls of the same age had tried a cigarette and 54 percent were regular smokers. Of those under age 16, 19 percent of boys and 33 percent of girls smoked in front of their parents. At the boy's school, 43 percent of the regular smokers (186 out of 614 questioned) wanted to give up smoking as compared to 50 percent of the regular smokers (85 out of 244 questioned) at the girl's school.

71-0931. Hirvonen, L., Peltonen, T., Pihlaja, T. **L'Enfant, le Tabac et le Pediatre. [The Child, Tobacco, and the Pediatrician.]** *Pediatre* 7(35):161-170, 1970, French.

A brief review is presented of some recent studies on the smoking habits of children and adolescents and the particular health hazards which smoking presents to the young. It is suggested that the smoking problem is also an important problem for the pediatrician, since the habit is usually acquired in childhood and adolescence. The smoking child is more susceptible to respiratory diseases than his nonsmoking friends. His strength and physical defenses are weakened, and he is less successful in his school work. His habit constitutes a high risk for him later in life: he will be more easily affected by disease and his life expectancy will be shorter. Thus, it is a challenge to the pediatrician to try his best to prevent his young patients from smoking.

71-0932. Journal of School Health. **AAHPER Position Statement. Smoking Education: The Schools Responsibility.** *Journal of School Health* 41(8):444-445, October 1971.

The schools should accept responsibility for providing smoking education programs and practices consistent with current information. A program of health instruction throughout the primary grades should emphasize experiences that provide opportunities for pupils to develop foundations essential to self-understanding and self-acceptance. In the intermediate grades, a clearly identified segment of the school day should be devoted to a health instruction program in which the content focuses on effective physical, social and mental functioning. At the junior and senior high school levels instruction should provide opportunities to explore the psychological, physiological and sociological factors involved in making wise decisions about smoking. The importance of peer acceptance, adult mimicking and the effect of advertising should be recognized. Professional preparation and in-service training programs should be required to improve competencies for teaching smoking and health education School personnel who smoke should provide an exemplar image consistent with current facts on smoking and health. Recommendations for steps to establish policies and practices consistent with current information on the hazards of cigarette smoking are listed.

71-0933. King, A. J. **Stress, Cigarette Smoking and Snacking Behaviour in Adolescent Males.** *Canadian Journal of Public Health* 62(4):297-302, July-August 1970.

The smoking behavior of male adolescents under stress was compared with that of unstressed male adolescents. Snacking behavior (the oral consumption of food and beverage items between meals) was also investigated No significant differences in amount of smoking were evident between the stressed and unstressed subjects although stress was reported. Smokers were found to snack significantly more than nonsmokers in both the stressed and non-stressed groups. Beverages and raw fruit and vegetables seemed to account for much of this significance as they were consumed in greater amounts by smokers. Stressed nonsmokers snacked significantly more than unstressed nonsmokers. Unstressed smokers snacked significantly more than unstressed nonsmokers. Interpretation of these results suggested that adolescent smokers may in fact be "high oral" individuals who are in a transitional stage from snacking to smoking behavior. The lack of a significant stress–smoking relationship was explained partly by the fact that teenage smoking may be largely a peer pressure phenomenon rather than a stress linked habit. As adolescents approach adulthood the smoking habit increases while the snacking habit probably decreases accordingly. The fact that adults who are attempting to stop smoking invariably eat more leads to the suggestion that it may well be possible to predict future heavy smokers by their "high oral" characteristics in late childhood or early adolescence. Such predicitions would be valuable in directing a campaign against smoking before it begins. (Auth. Abs.)

71-0934. Lebedun, M., Donovan, L. P. **Cognitive Dissonance and the Smoking Behavior of Researchers on Smoking.** *Missouri Medicine* 68(9):700-703, September 1971.

This questionnaire survey was concerned with determining relationships between cognitive dissonance and smoking behavior among researchers recently engaged in investigations of smoking-related problems. Of questionnaires sent to 339 researchers listed in the 1968 Directory of On-Going Research in Smoking and Health 184 responded. The researchers consisted of 34.8 percent nonsmokers, 35.3 percent ex-smokers and 29.9 percent current smokers. A comparison of these smoking characteristics with those in the general population showed at least a 10-percent difference in each of the three categories. Three times as many researchers quit smoking as people in the general population. A close association was found between the smoking habits of the researchers and physicians, the latter determined from prior national studies involving physicians only. Of 43 researchers involved in treating clients to help them quit smoking, 18.7 percent were current smokers, 48.8 percent were nonsmokers and 32.5 percent were ex-smokers. Of 120 ex-smokers and current smokers, 39 percent attributed their quitting or reduction in rate of smoking to being involved in smoking research. A majority (63.4 percent) of the respondents reported that doing smoking research influenced their attitudes and behavior toward smokers. Most of these directed their efforts toward convincing and aiding smokers to quit. Although the respondents were less likely to be current smokers and more likely to be ex-smokers than individuals in the general population, dissonance created in the smokers among the researchers was not considered a major determinant of this difference because of the coincident high educational and economic status of the sample.

71-0935. McFall, R. M., Hammen, C. L. **Motivation, Structure, and Self-Monitoring: Role of Nonspecific Factors in Smoking Reduction.** *Journal of Consulting and Clinical Psychology* 37(1):80-86, 1971.

A comparison of the outcomes of major stop-smoking studies reveals an intriguing similarity of data across a variety of different procedures, populations, and theoretical orientations. The elements of motivated volunteering, structure, and self-monitoring were regarded as nonspecific factors common to all these stop-smoking studies. A stop-smoking clinic was designed which offered no "treatment" but encouraged motivated volunteers to employ self-control and required them to monitor their smoking and report progress at regular intervals. The outcome of the nontreatment clinic program was comparable to others reviewed and suggests that the nonspecific factors studied may account for the temporary behavior change found in most smoking treatments. (Auth. Abs.)

71-0936. McRae, C. F., Nelson, D. M. **Youth to Youth Communication on Smoking and Health.** *Journal of School Health* 41(8):445-447, October 1971.

A youth-centered smoking and health program developed by the Broome County Interagency Council on Smoking, Binghamton, New York is described. At their organizational meeting, the youths decided that the group which could be most effectively reached was the 5th and 6th graders whom they felt were still in the process of making a decision about smoking. A questionnaire survey of the habits and attitudes of the target group showed that of 8,129 who responded, 96.1 percent were nonsmokers. Smoking was considered a health hazard by 83.3 percent of the smokers and 96.2 percent of the nonsmokers. Of the smokers, 10.2 percent were smoking a half-a-pack or more per day and 50 percent were smoking a half-a-pack a week. Reasons for smoking ranged from "tastes good" (5.7 percent) to "relaxation" (22.1 percent). Most nonsmokers (68.5 percent) gave health as a reason for not smoking. The youth group contacted voluntary and official health agencies and other community group for materials and visual aids to be used in their presentations to the 5th and 6th graders. In a period of 19 days, 70 teenagers visited 71 of the 75 elementary school in the county and reached approximately 10 000 5th and 6th graders. The reaction from the community, the schools, the teenagers and the preteens demonstrated the effectiveness of youth-to-youth communication. An evaluation of the program showed that the 5th graders were more receptive than the 6th graders and it was recommended that the program start on 4th graders. The teenagers stated they wanted straight facts but were being given too much propaganda. The true effectiveness of the program will be determined when the 5th and 6th graders are resurveyed sometime in high school.

71-0937. Pan American Sanitary Bureau. **Control of Cigarette Smoking. Report on Measures Taken in the Americas to Control the Advertising.** In: XVIII Pan American Sanitary Conference. Pan American Sanitary Bureau, Official Document No. 108, 1971, pp. 393-396.

The extent of cigarette smoking as a serious public health problem in the Americas is reviewed. The Pan American Health Organization recently called for an inquiry into the measures being taken in the Region for the control of cigarette smoking. This survey showed that six countries exercise some control over tobacco growing and processing but set no standards governing tar and nicotine content of tobacco products. Information from six countries on cigarette sales showed increases varying from 8 to 113 percent for the last 10 years and between 59 and 188 percent for the last 20 years. Only one country reported regulations governing cigarette sales but these referred only to payment of taxes and the requirement of a cigarette sales license. Restrictions on smoking in public places exist in 14 countries but these are mainly concerned with fire prevention and only cover public transport vehicles and certain places of public entertainment. Legal restrictions on the advertising of cigarettes have been adopted by Argentina, Panama, Peru and the U.S. Canada has relied on voluntary restrictions self-imposed by the tobacco industry and advertisers in the face of community pressure. Both the U.S. and Canada have sponsored educational programs to help smokers give up the habit and prevent school children from starting to smoke, have made surveys of smoking habits, motivations and attitudes, and both have strong support from private organizations. Four other countries of the Region have indicated that they are undertaking educational programs to combat cigarette smoking and 14 others are definitely planning educational programs and restrictive advertising controls on cigarette smoking. The Pan American Health Organization is planning a survey of eight Latin American cities which will provide information on the prevalence of smoking and the social, cultural and demographic characteristics of smokers, will help health authorities in these countries to formulate policies and programs on the use of tobacco, and will indicate the starting point for a correct evaluation of the effectiveness of control programs.

71-0938. Piedrola Gil, G. **Encuesta Realizada en los Alumnos del 6.° Curso de Medicina de la Facultad de Medicina de Madrid. Habitos, Recreaciones, Vocaciones, Enfermedades, Proyectos Futuros y Aspectos de su Formacion. [Survey of Sixth-Year Medical Students at the School of Medicine of Madrid. Habits, Recreation,**

Vocations, Illnesses, Future Plans, and Aspects of Their Background.] *Anales de la Real Academia Nacional de Medicina* 88(1):117-147, 1971, Spanish.

A questionnaire survey of 1,131 medical students (919 men and 212 women) in Madrid, Spain, was undertaken in order to determine how they thought, how they lived, likes and dislikes, etc., during their final year of medical school. A total of 90.8 percent of male students and 87.7 percent of female students were single. Results indicate that 75 percent of single male students and 70.9 percent of married male students were smokers; 41.4 percent of single and 38.4 percent of married female students smoked. The daily consumption of cigarettes ranged from 2 to 20 cigarettes for approximately 88 percent of the male smokers and 80 percent of the female smokers. Approximately 12 percent of the male smokers and 20 percent of the married female smokers smoked more than 20 cigarettes per day. Only 4.6 percent of the single female smokers smoked more than one pack per day. That smoking was a dangerous habit was acknowledged by 90 percent of the respondents, and yet, 75 percent of single male students and 41.4 percent of single female students smoked habitually. Based on these findings, it is recommended that: all incoming medical students should be made aware of the health hazards due to smoking by means of a health education campaign; all professors should be advised not to smoke during classes, seminars, or laboratory sessions; and smoking should be forbidden while attending to patients.

71-0939. Roberts, C. J., Fasal, E., Lillick, L. C. **Association of Psychosocial Factors to the Smoking Practices of High School Students.** *Chronic Disease Quarterly* (Supplement No. 17):1-73, August 1970.

Psychosocial factors and personality characteristics thought to influence smoking behavior of high school students were investigated. The Gough Adjective Check List and specially developed general information and smoking questionnaires were administered to 495 subjects who were then subdivided into regular smokers, ex-smokers and nonsmokers. Psychosocial factors were classified according to their sphere of influence: "peer," "family," "self," and "school," and chi-square tests were applied to determine those factors for which significant differences existed among smoking categories. The significant factors from all 37 areas were then pooled and subjected to multivariate analysis. Altogether, 25 factors were found to have significant discriminating ability in the comparisons of the three smoking categories. The most important were "peer" factors, followed by "family" and "school" factors. The one factor that discriminated most effectively between smokers and nonsmokers as well as smokers and ex-smokers irrespective of sex was "how many of four best school friends smoke." "Mother's attitude toward smoking" was the next best discriminator between smokers and nonsmokers of both sexes, and between smokers and ex-smokers among girls. The latter was replaced by "father's attitude" among boys. For girls, "grade average" ranked third in importance in the smoker-nonsmoker comparison, while another "peer" factor (who of friends most upset) took third place for boys. The analysis revealed also that the series of significant factors was able to discriminate between any pair of smoking categories with 100 percent accuracy. Most-cited reasons for starting to smoke were "conformity" and "to impress others," but personal gratification influenced the individual's decision whether or not to continue. Personality profiles based on the Gough Adjective Check List and the discrepancy between "real self" and "ideal self" both failed to differentiate between smoking categories. (Auth. Abs. Mod.)

71-0940. Rose, G. **A Controlled Trial of the Effects of Health Education in High-risk Subjects.** *Annales des Societes Belges de Medicine Tropicale, de Parasitologie et de Mycologie Humaine et Animale* 50(4):481-487, 1970.

The general principals that have been followed in setting up a controlled trial investigation of the health benefits derived from cessation of smoking are presented. High-risk individuals are identified on the basis of results of a 15-minute screening examination which has been applied to 14,000 male civil servants in Inner London, aged 40 and over. The cigarette smokers with the highest risk-scores are selected for the trial. It is hoped that a total of 1,500 such men will enter the trial and be randomly allocated to either the treatment or the control group. Treatment consists of 15-minute consultations with a physician who advises the patient of the positive gains from stopping, rather than the dangers of continuing his smoking habit. Each man knows that he is one of only a relatively small number, selected because of the special hazards of cigarette smoking to him in particular. Most of those who respond to the advice given do so by an immediate and complete cessation of cigarette smoking. Contact is maintained over several months through personal consultations and mailed progress reports in an effort to minimize relapses.

71-0941. Rowland, J. A. **How About Smoking?** *Nursing Outlook* 19(6):422-423, June 1971.

Antismoking efforts at the Veterans Administration Hospital in Topeka, Kansas, centered around the use of group discussion to help both patients and medical personnel in giving up the smoking habit. Film, literature and posters were utilized and attempts made to discourage personnel from smoking. For those who continued to smoke, special areas away from the patients were provided. Some of the typical questions asked about smoking at the meetings and their answers are given. The meetings served the purpose of keeping the dangers of smoking constantly before both patients and personnel with emphasis on preventive aspects of health care.

71-0942. Schechter, M. D., Rosecrans, J. A. **C.N.S. Effect of Nicotine as the Discriminative Stimulus for the Rat in a T-Maze.** *Life Sciences* 10(14, Pt. 1):821-832, 1971.

Rats were trained to make a specific behavioral response in a T-maze apparatus conditional upon whether they were injected subcutaneously with 400 micrograms/kg nicotine or saline. This differential response was dose- and time-related. Pretreatment with 750 micrograms/kg hexamethonium had no effect on the rats' ability to discriminate the cueing effect of nicotine, whereas, pretreatment with 500 micrograms/kg mecamylamine significantly inhibited this effect. It appears that whatever the cues were to which the rats differentially responded, the effect is mediated by nicotine's action on the central nervous system. (Auth. Abs.)

71-0943. Silverman, A. P. **Behavior of Rats Given a 'Smoking Dose' of Nicotine.** *Animal Behaviour* 19:67-74, 1971.

The social behavior of rats of two laboratory strains was observed before and after the subcutaneous injection of nicotine. The dose, 25 micrograms per kg, was about equivalent to that inhaled by a man smoking a cigarette. Paired male rats were separated daily, and observed once a week for 6 minutes after re-introduction. Acts and postures described by Grant & Mackintosh (1963) were recorded, and interpreted statistically by discriminant analysis and regression equations. There was a barely significant difference in the baseline observations between the randomly selected experimentals and controls. However, the difference was much greater after the administration of nicotine, was greater still after four daily injections, and fell to insignificance when nicotine was administered to the former controls, instead. The effects of nicotine therefore appear to be additive to differences between individual rats, and so were more clearly seen by considering the rats as their own controls. The greatest contribution to this effect of nicotine, in both albino and hooded rats, was a consistent reduction of aggression. In one observation, other behavior involving approach to the other rat, investigation, sexual, and submission, was also slightly reduced; there was a little evidence that escape was marginally increased, and in one observation, a possible indication of nausea. The total activity of the rats was not consistently affected by nicotine. These other effects seemed insufficient to account for the reduction of aggression, and it was argued that, at a behavior level, nicotine may have modulated this directly. (Auth. Abs.)

71-0944. Uragoda, C. G., Senewiratne, B. **Tobacco Smoking in Ceylon.** *Journal of Tropical Medicine and Hygiene* 74(7):145-147, July 1971.

A survey was made of smoking habits in Kandy, Ceylon. Of the 1127 subjects interviewed, 548 were males and 579 were females. Only 9 of the females smoked compared to 264 males. The survey revealed that 90.1 percent of the smokers consumed cigarettes, 5.9 percent smoked beedi (tobacco wrapped in the dried leaf of *Diospyros melanoxylon*), 3.7 percent smoked cheroot, and 0.3 percent smoked both beedi and cheroot; 36.6 percent of the smokers were betel chewers as well. Persons with a higher education smoked cigarettes in preference to beedi and cheroot. The per capita consumption of tobacco in Ceylon, the proportion of smokers in the sample and the daily average number of cigarettes smoked are low in comparison to similar figures for the United Kingdom. This probably explains the low frequency of bronchial carcinoma in Ceylon.

71-0945. U.S. Department of Health, Education, and Welfare. Public Health Service. National Clearinghouse for Smoking and Health. **Teenage Smoking. National Patterns of Cigarette Smoking, Ages 12 Through 18, in 1968 and 1970.** U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration, National Clearinghouse for Smoking and Health, Rockville Maryland, DHEW Publication No (HSM):72-7508, 1971.

Two comprehensive studies have been made of the patterns of smoking as well as the prevalence of smoking among teenagers in the United States. In 1968, the initial survey consisted of 4931 boys and girls aged 12 to 18 inclusive. Approximately 350 teenagers were interviewed for each sex and age level. A second survey completed in 1970, consisted of 2640 boys and girls of the same age levels as the first survey with approximately 185 interviews per age and sex. Results indicate an increase in teenage smoking for both sexes and at every age level in the two-year interval between the surveys. The smoking rates have increased in all sections of the country, in rural as well as metropolitan areas. The immediate environment of the teenager was found to have a profound effect on his smoking habit. Whether he lives in a home where one or both parents are absent, the education and occupation of the parents, the habits of older siblings–all have an influence on the behavior of the youth. Those in a higher socioeconomic environment are less likely to smoke than are those less advantaged. In families in which at least one of the parents attended college, teenagers have lower smoking rates than those in whose families neither parent attended college. If both parents smoke, the teenager is twice likely to be a smoker himself than if neither parent smokes. If an older sibling smokes the chances of a teenager smoking are also greatly increased. Differences in the teenagers themselves indicate that high school students who are in college preparatory courses are less likely to be smokers than those in other courses. Those teenagers who work either part- or full-time have more than 2.5 times the smoking rates as those who do not work. Two encouraging findings from the surveys were that 9 out of 10 teenagers express the opinion that smoking is harmful to health, and almost that many predict that they will not be cigarette smokers 5 years from now.

71-0946. Ward, S. **Television Advertising and the Adolescent.** *Clinical Pediatrics* 10(8):462-464, August 1971.

A total of 1,094 adolescents, 12 to 17 years of age, were surveyed to ascertain the attitudes of adolescents toward television commercials, and to analyze the effects of television advertising on adolescents. In response to a questionnaire asking for examples of "Best" and "Worst" commercials and reasons for these judgments, no category of advertisements was overwhelmingly liked. However cigarette advertising was singled out as "worst TV advertising". Anti-smoking advertisements were liked because they were considered straightforward; and not surprisingly, cigarette advertising was disliked because it was considered hypocritical and in bad taste. They were unequivocal in their negative response to cigarette advertising (17 percent of the total sample). The motivations or reasons for watching commercials are important in order to understand and predict attitudes, materialism, and the effects on buying. This study suggests not that adolescents are helpless victims of television, but rather that they are a responsive audience with identifiable likes and dislikes. The more intelligent adolescent is less materialistic and less affected by television advertising.

SMOKING CESSATION METHODS

71-0947. Biernacki, T., Sulestrowski, W., Szafnagel, A. **Leczenie Nikotynizmu Jako Ogniwo Medycyny Profilaktycznej. [Treatment of Nicotinism as a Link in Preventive Medicine.]** *Wiadomosci Lekarskie* 24(16):1573-1575, August 15, 1971, Polish.

The problem of treating nicotinism on a wider scale is discussed in terms of using available outpatient and inpatient health services and sanatoriums, and in population groups under constant medical supervision. A flexible treatment plan is suggested which can be applied selectively to each case on the basis of Schaer's classification of smokers. Individual psychotherapy strengthened by group psychotherapy is postulated together with the introduction of several drugs as psychotherapeutic vehicles–vitamin dragees with antiseptic agents which would have a stronger psychic effect on the patient than the usual mint candies.

71-0948. Chapman, R. F., Smith, J. W., Layden, T. A. **Elimination of Cigarette Smoking by Punishment and Self-Management Training.** *Behavior Research and Therapy* 9(3):255-264, 1971.

Faradic shock punishment and self-management training were used in an attempt to eliminate cigarette smoking in two groups of subjects (23 total) who had smoked from four to 48 years and from 14 to 60 cigarettes per day. Group I received two weeks of post-treatment therapist monitoring while Group II received 11 weeks. Only one subject in each group failed to stop smoking during the course of aversion and self-management treatment, and reduction to zero cigarettes per day occurred within four to five successive treatments. Post-treatment follow-ups at one, three, six and twelve months revealed longer cessation of smoking in the second group. Six of the eleven subjects in the second group were not smoking at the twelve month follow-up as compared to three of the twelve subjects in the first group. The results suggest that (1) faradic shock punishment combined with self-management training will for most subjects eliminate cigarette smoking, and (2) post-treatment therapist monitoring seems to be an important variable affecting long term cessation of smoking. (Auth. Abs.)

71-0949. Cousin, M. **Comment Supprimer le Besoin de Fumer? [How to Suppress the Need to Smoke?]** *Vie Medicale* 52(25):3035-3039, July 1971, French.

The various reasons which can motivate a smoker to quit, and the different individual methods and aids which can be helpful in accomplishing this goal are outlined. To stop smoking is easy for a person with strong will power; for others, it is more difficult and thus no method should be overlooked. Several possible measures to be taken at the national level are also mentioned.

71-0950. Evans, J. W. **Double-Blind Trial of Fenfluramine as an Aid to Stopping Smoking.** In: Seminar on Fenfluramine and Obesity, Nassau, Bahamas, February 22-26, 1971. *South African Medical Journal* (Supplement):33-34, June 19, 1971.

Forty patients (20 men and 20 women) took part in a double-blind cross-over trial designed to compare the possible effects of fenfluramine with that of a placebo as an aid to stopping smoking. The results showed that fenfluramine is no more active than placebo in removing the desire to smoke cigarettes. The patients were highly motivated and had volunteered to take part in the study rather than being told by their physician that they must stop smoking. In spite of this, less than a third of them (12) could complete the trial. The group of patients who dropped out contained at least 12 who did initially reduce their cigarette consumption, and these were more numerous (9 out of 12) among those taking fenfluramine than those taking placebo (2 out of 7). Furthermore, the group included all six of the smokers who complained of unpleasant side-effects. All six of these were taking fenfluramine.

71-0951. Gordon, W. W. **The Treatment of Alcohol (and Tobacco) Addiction by Differential Conditioning. New Manual and Mechanical Methods.** *American Journal of Psychotherapy* 25(3):394-417, July 1971.

A research project is described in which an attempt was made to evolve biologic forms of aversion therapy which may be applicable to alcohol and tobacco addiction, but which, when perfected, may also prove useful in producing aversions to sweet foods, compulsive eating, and sexual perversions. It is asserted that the natural appetites and the natural aversions are determined by the formation of conditioned, differentially associated paired systems based upon the ingestion and rejection reflexes. By building up appropriate systems in training, control of addiction may be achieved. Patients have been treated using a manual technique. A mechanical technique is also described. The results have been outlined and an improved form of technique is predicted in the light of experience gained and on the basis of theoretical considerations. The relationship between conditioning to people (as physical entities which may act as conditioned signals) and alcoholic addiction is discussed. Considering aversion therapy and psychotherapy in terms of patterns of nerve stimulation in time and space (and the basic nature of the nerve impulse which underlies both forms of treatment makes this obligatory), a reconciliation of divergent views may be encouraged. (Auth. Abs. Mod.)

71-0952. Lancet. **Words of Warning. (Editorial)** *Lancet* 1(7700):638, March 27, 1971.

The British Government's plans for reducing cigarette smoking include an agreement with tobacco manufacturers for a health warning on cigarette packages. However, tobacco advertising will not be banned and advertising will refer to the health warning but will not repeat it. This agreement with the tobacco industry will fall through unless Sir Gerald Nabarro withdraws his Tobacco and Snuff (Health Hazards) Bill. The government is also studying alternative revenue sources if cigarette consumption falls, less dangerous forms of smoking, and methods for determining tar and nicotine contents of different cigarette brands. Transportation concerns and entertainment managers are to be asked to set aside more nonsmoker accommodations.

See also **71-0940**

71-0953. Rose, G., Udechuku, J. C. **Cigarette Smoking by Hospital Patients.** *British Journal of Preventive and Social Medicine* 25(3):160-161, August 1971.

An inquiry is reported into the cigarette smoking habits of patients with chronic cardiovascular and respiratory diseases recently discharged from hospital. Among the 93 who smoked in the two weeks before admission, anti-smoking advice by hospital staff was recalled by 69 percent, of whom two-thirds had nevertheless continued to smoke after leaving hospital. There should be research to find more effective means of delivering anti-smoking advice to hospital patients. (Auth. Abs.)

71-0954. Bastide, H., Houdaille, J. **Epidemiologie de Tabac en France et Dans le Monde. [Epidemiology of Tobacco in France and in the World.]** *Vie Medicale* 52(25):2989-2995, July 1971, French.

A general review of the world-wide tobacco problem is presented. The increase in consumption of tobacco in most European countries, Australia, and the United States since 1935 is discussed. Mortality figures available related to tobacco consumption are presented, and several studies which have indicated a relationship between tobacco and lung cancer, other cancers, and heart disease are mentioned.

71-0955. Public Health. **Special Report: Eight Years After.** *Public Health* 85(3):133-136, March 1971.

The recently published report of the Royal College of Physicians, 'Smoking and Health Now,' is firmly endorsed. The basic principal behind all the report's recommendations, strong discouragement and restriction rather than total prohibition of smoking, is upheld and the various methods by which these recommendations could be put into effect are discussed. The effects on the public of the first report by the Royal College of Physicians published 8 years ago are analyzed, and its successes as well as failures are considered for possible guidelines for future measures.

71-0956. Bhagat, B., Rana, M. W. **Effect of Chronic Administration of Nicotine on the Concentrations of Adrenal Enzymes Involved in the Synthesis and Metabolism of Adrenaline.** *British Journal of Pharmacology* 43(1):250-251, September 1971.

Chronic administration of nicotine (1 mg/kg injected subcutaneously 5 times/day for 6 days/week for 12 weeks) in male Holtzman rats resulted in an increase in tyrosine hydroxylase and catecholamine concentrations in the adrenals, but failed to affect adrenal monoamine oxidase, catechol-O-methyl transferase or phenylethanolamine N-methyl transferase activities. (Auth. Abs. Mod.)

71-0957. Bhagat, B., Bayer, T., Lind, C. **Effects of Chronic Administration of Nicotine on Drug-Induced Hypnosis in Mice.** *Psychopharmacologia* 21:287-293, 1971.

Chronic administration of nicotine in mice for six weeks did not affect the duration of hypnosis by pentobarbital, hexobarbital, barbital or zoxazolamine. The onset of barbital hypnosis remained unaffected. These results suggest that chronic administration of nicotine did not affect the drug metabolizing activity of hepatic microsomes. While psychotropic drugs significantly potentiated the hypnosis due to pentobarbital and hexobarbital, the degree of potentiation was the same in both chronically nicotine pretreated mice and controls. Nicotine pretreatment significantly increased the duration of sleeping time caused by ethanol alone. However, when treatment of nicotine continued for a longer period of time, the duration of hypnosis induced by ethanol returned to control level. (Auth. Abs.)

71-0958. Brookes, P., Duncan, M. E. **Carcinogenic Hydrocarbons and Human Cells in Culture.** *Nature* 234(5323):40-43, November 5, 1971.

The effects of carcinogenic hydrocarbons on primary human embryo cells were examined and compared with their effect on human tumor cells (HeLa). Human embryo fibroblast cultures were prepared from lung, skin/muscle, and gut tissues and tested for their ability to metabolize and bind ^{3}H-labelled benzo(*a*)pyrene (BP) and 7,12,-dimethylbenz(*a*)anthracene (DMBA) while similar studies were carried out with HeLa cells. Both hydrocarbons were metabolized by the embryo cells, DMBA rather more slowly than BP. The lung cells metabolized most efficiently and retained this property during subculture. On the other hand, the gut cells had a significantly poorer rate of metabolism after 40 days in culture. The binding of BP and DMBA to DNA, RNA, and protein in the primary lung cells was determined after isolation of these cellular macromolecules. The rate of hydrocarbon metabolism in human embryo cells was found to be similar to that in rodent embryo cells, and at least for BP, binding to macromolecules was also similar. The binding index for DMBA, although of the same order as for BP, was significantly less than the high value obtained previously with mouse embryo cells. In HeLa cells, both BP and DMBA were metabolized, but the latter was considerably slower. While BP binding to DNA, RNA, and protein was significantly less in HeLa cells than in primary human lung cells, DMBA binding was similar in both cell types. The data indicate that primary human lung cells resemble mouse embryo cells in the degree to which BP becomes bound to cellular macromolecules following metabolism. There have been reports of mouse and hamster cells being transformed in culture by hydrocarbons and of these transformed cells producing tumors when injected into adult animals. The present experiments suggest that the necessary conditions exist for the transformation of human lung cells by BP.

71-0959. Dalhamn, T., Rylander, R. **Reduction of Cigarette Smoke Ciliotoxicity by Certain Tobacco Additives.** *American Review of Respiratory Disease* 102(6):855-857, June 1971.

The anticiliostatic effect of addition of oxolamine citrate to cigarette tobacco shown in earlier experiments was further elucidated using derivatives of the original compound. Citric acid, diethylamine citrate, phenylvinyloxadiazole (PVO), and phenylmethyloxadiazole (PMO) were added to cigarette tobacco. The ciliostatic effect of the smoke was evaluated in short term exposure experiments in cats in vivo. The anticiliostatic effect was demonstrated for PVO and PMO. Experiments with varying concentrations of PMO indicated that a maximal effect was present at concentrations of approximately 2 percent of tobacco weight. (Auth. Abs.)

71-0960. Dontenwill, W., Harke, H.-P., Baars, A., Goertz, E. **Experimental Studies on the Intake and Deposition of Smoke Particles in the Passive Smoking of Cigarette Smoke by Golden Hamsters.** Complete English translation of "Experimentelle Untersuchungen uber Aufnahme und Ablagerung von Rauchbestandteilen bei der passiven Berauchung von Goldhamstern mit Zigarettenrauch," *Arzneimittel-Forschung* 21(1):142-143, January 1971.

See **Abstract 71-0193.**

71-0961. Forwerg, W., Crecelius, W. **Bestimmung von Nikotin in Luft am Arbeitsplatz. [Determination of Nicotine in the Air of a Working Area.]** *Zentralblatt fur Arbeitsmedizin und Arbeitsschutz* 21(7):214-218, July 1971.

A modification of the Asmus photometric method permits the quantitative determination of nicotine in working areas. Nicotine is selectively absorbed from tobacco smoke by a mixture of 0.1N sulfuric acid and 0.2 percent n-butanol and the acid is then neutralized by sodium hydroxide. Phosphate buffer, potassium cyanide, and barbituric acid are then added, resulting in a coloration whose intensity at 510 mm is a measure of the concentration of nicotine in the solution. Six measurements were made showing an average absorption of 98 percent with a standard deviation of 6 percent. Disturbing influences of other nicotine alkaloids, such as nornicotine, anabasine, and beta-nicotyrine, appear in trace amounts only and can be disregarded.

71-0962. Gerhardt, T., Gothert, M., Malorny, G., Wilke, H. **Zur Frage der Toxicitat von Kohlenoxid bei Atmung von CO-Luftgemischen unter erhohtem Druck. [Toxicity of Carbon Monoxide in Man Breathing Mixtures of CO and Air at Elevated Pressure.]** *Internationales Archiv fur Arbeitsmedizin* 28(2):127-140, August 31, 1971, German.

Investigations were carried out in healthy nonsmoker volunteers to learn whether carbon monoxide would be more toxic under increased pressure than under normal pressure, if this gas is inspired at the same concentration under both conditions. It was shown by measurements of CO concentration in alveolar air and of the COHb content of blood that at 3 atmospheres the blood is saturated faster with carbon monoxide than under normal atmospheric pressure, indicating that under increased pressure diffusion equilibrium in the organism is achieved earlier. In subjects breathing 100 ppm CO for 2 hours the CO concentration in alveolar air is 73 ppm under 3 atmospheres and not more than 36.7 ppm at 1 atmosphere. This result is explained by the increased CO supply under increased pressure. It must be emphasized that the COHb concentration is significantly lower under increased pressure than under atmospheric pressure ($p < 0.001$), once diffusion equilibrium has been attained. In subjects breathing 50 ppm CO, the COHb concentration is only 4.5 percent at 3 atmospheres but 7.25 percent at 1 atmosphere. This result is explained by application of the law of mass action on the competition of CO and O_2 for the receptor hemoglobin in the blood. It was concluded from the experimental data that there is no reason to lower the threshold limit value of 50 ppm CO for work carried out under increased pressure. (Auth. Abs. Mod.)

71-0963. Goldenberg, M. M. **Relationship Between Chronic Vagal Denervation and the Response of the Isolated Rat Ileum to Nicotine.** *Archives Internationales de Pharmacodynamie et de Therapie* 192(2):353-361, 1971.

Chronic denervation of the abdominal vagi in rats for 3-6 weeks did not alter the biphasic contractile response of the ileum to nicotine or to acetylcholine (ACh), *in vitro* when compared to the responses of the normal ileum found in a previous study. Atropine blocked the primary spike-like contraction to nicotine but did not affect the slow, secondary contraction while the responses to ACh were abolished. DMAE (α,α'-bis(dimethylammonium-acetaldehyde diethylacetal)-*p,p'*-diacetylbiphenyl bromide), cocaine, and strychnine effectively inhibited the biphasic response to nicotine without a similar action on the response to ACh. Hexamethonium inhibited only partially the primary spike-like contraction to nicotine, but a combination of hexamethonium and atropine caused complete blockage of the first response and moderate inhibition of the secondary response. DMAE combined with hexamethonium elicited greater blockade of the biphasic response to nicotine than either one alone. Histochemically the acetylcholinesterase content in the vagally-denervated rat ileum was markedly decreased. It was concluded that excitation of cholinergic and of noncholinergic intrinsic nerves by nicotine in the rat ileum is not prevented by chronic vagal denervation. (Auth. Abs.)

71-0964. Goldfarb, J., Sharpless, S. K. **Effects of Nicotine and Recurrent Inhibition on Monosynaptic Reflexes in Acute and Chronic Spinal Cats.** *Neuropharmacology* 10(4):413-423, July 1971.

The present experiments were undertaken to examine some of the changes which take place after spinal section in the cat. Recurrent inhibition was greater in cats 7-14 days after spinal section than in acute spinal preparations (P less than 0.05). The increased potency of the inhibitory pathway subsided by 25-30 days following spinal section. The general trend of the size of the inhibitory response to intravenous nicotine in spinal and hemisected animals, paralleled the change in recurrent inhibition observed in spinal cats, although the data did not reach statistical significance ($P \leqslant 0.05$). In hemisected cats, there appeared to be an overall increase in recurrent inhibition similar to that seen in spinal preparations (not significant $P \leqslant 0.05$). In addition, there appeared to be increased recurrent inhibition on the hemisected side as compared to the acute side in cats 14-32 days following hemisection. There was clearly no increase in the response to nicotine on the hemisected as compared to the acute sides. When the control animals were ranked using the strength of recurrent inhibition and the degree of depression of the monosynaptic reflex by nicotine as criteria, the rank orders for each measure were identical. No such relationship was obtained for any group of chronic animals, suggesting a differential change in sensitivity to nicotine and synaptic activation of the recurrent inhibitory system. The results are discussed from the standpoint of disuse of spinal pathways following cord injury. (Auth. Abs.)

71-0965. Horvath, S. M., Dahms, T. E., O'Hanlon, J. F. **Carbon Monoxide and Human Vigilance. A Deleterious Effect of Present Urban Concentrations.** *Archives of Environmental Health* 23(5):343-347, November 1971.

This study was conducted to determine whether carbon monoxide gas is a factor responsible for deterioration of vigilance in men breathing polluted air. Ten subjects were exposed for slightly longer than two hours, on separate occasions, to CO levels approximating the average (26 ppm) and peak (111 ppm) levels found while driving in urban traffic. Smokers were not used as subjects because their blood COHb levels were already elevated. During the last hour of each exposure the subjects undertook a standard test of visual vigilance. They also undertook the test while breathing air without CO. Blood carboxyhemoglobin levels were measured prior to exposure, before and after the tests. Heart rates and minute ventilatory volumes were also measured. The results showed that vigilance was impaired by breathing 111 ppm CO which raised the average COHb level to 6.6 percent. Heart rates and minute ventilatory volumes were not affected. (Auth. Abs. Mod.)

71-0966. Langer, A. M., Mackler, A. D., Rubin, I., Hammond, E. C., Selikoff, I. J. **Inorganic Particles in Cigars and Cigar Smoke.** *Science* 174(4009):585-587, November 5, 1971.

A number of crystalline and optically isotopic inorganic materials are used in the manufacture of reconstituted tobacco sheets. These sheets, used primarily in inexpensive cigars, often contain diatomaceous earth, which exists in part in the silica mineral form cristobalite, a known fibrogen. Diatom fragments with this crystalline form have been observed in the main smoke stream of cigars made with these tobacco sheets. (Auth. Abs.)

71-0967. Maher, V. M., Lesko, S. A. (Jr.), Straat, P. A., Ts'o, P.O.P. **Mutagenic Action, Loss of Transforming Activity, and Inhibition of Deoxyribonucleic Acid Template Activity In Vitro Caused by Chemical Linkage of Carcinogenic Polycyclic Hydrocarbons to Deoxyribonucleic Acid.** *Journal of Bacteriology* 108(1):202-212, October 1971.

In a solvent system of 0.01 M phosphate buffer (pH 6.8)-ethanol (2:1, v/v) and in an iodine-induced reaction, the polycyclic hydrocarbons (^{3}H)3,4-benzopyrene and (^{3}H)3,4-BP/(^{3}H)9,10-dimethyl-1,2-benzanthracene (DMBA) can be covalently linked to deoxyribonucleic acid (DNA) at room temperature. By stepwise addition of the hydrocarbon and repeating the reaction two to three times after isolating the hydrocarbon DNA adduct, it was possible to introduce as many as one covalently bound hydrocarbon molecule per 100 nucleotide bases. When 3,4-BP and DMBA were linked in this way to biologically active transforming DNA of *Bacillus subtilis*, they caused reduction of the transforming activity of the DNA accompanied by significant increases in the frequency of forward mutations. The majority of these hydrocarbon-induced mutations were not able to revert spontaneously. These samples of DNA covalently linked with hydrocarbons showed much lower levels of survival of biological activity when assayed in recipient strains (*hcr*) which are known to be deficient in the enzymes required for repair of ultraviolet light-induced damage to DNA. 3,4-BP covalently linked to calf thymus DNA at a level of approximately one hydrocarbon molecule per 330 bases was shown to cause up to 80 percent inhibition of the in vitro transcription of the DNA by highly purified ribonucleic acid polymerase prepared from *Micrococcus luteus* under the experimental condition of template saturation. The presence of 3,4-BP and DMBA molecules covalently bound to *B. subtilis* DNA samples was also found to prevent complete denaturation of the bihelical structure of certain DNA molecules and thus appears to effect a cross-link in these DNA molecules. (Auth. Abs.)

71-0968. Mamatsashvili, M. I. **On the Detrimental Effect of Carbon Monoxide and Sulfur Dioxide on Fertility of Female Rats.** *Hygiene Sanitation* 76:277-279, 1970.

Albino rats were exposed for 72 days to inhalation of 1 and 2 mg/m^3 CO and 0.5 and 4 mg/m^3 SO_2, as well as a mixture of these compounds, 2 and 4 mg/m^3, respectively. Both CO and SO_2 had detrimental effects on the estral cycle and fertility of the animals and a stimulating influence on the endocrine system, which could evidently be due to increased pituitary function. The strongest effect was produced by a mixture of high concentrations of CO and SO_2.

71-0969. Mesolella, C., Perrella, F., Testa, B., Morelli, G. **Rilievi Oto-Neurologici in un Gruppo di Operai Esposti Cronicamente all'Azione dell'Ossido di Carbonio. [Oto-Neurological Observations in a Group of Workmen Chronically Exposed to the Action of Carbon Monoxide.]** *Archivii Italiani di Laringologia* 78(1):47-60, January-February 1970, Italian.

After describing the difficulties which exist in defining chronic carbon monoxide intoxication and presenting previous research and observations of related acoustic and vestibular changes, this study reports the results of oto-neurological investigations which were carried out on 44 workmen. Because of the various types of work performed, these workmen had been exposed to carbon monoxide for a long period of time, ranging from 1 to 25 years. However, none had complained of acute intoxication. Among those studied, 10 had perceptive bradyacusia, 4 had a vestibular hyporeflexivity, and 24 showed slight electroencephalographic alterations. The lack of a relationship between the degree and constancy of oto-neurological damage and the duration of CO exposure, the levels of carboxyhemoglobinemia, and the levels of blood iron did not allow the observed alterations to be attributed to carbon monoxide intoxication. It is suggested that these alterations can be attributed to other chronic intoxications due to acute poisonings from other toxic industrial substances which are not observed by the subject.

71-0970. O'Donnell, R. D., Chikos, P., Theodore, J. **Effect of Carbon Monoxide Exposure on Human Sleep and Psychomotor Performance.** *Journal of Applied Physiology* 31(4):513-518, October 1971.

Recent studies have indicated that human performance degrades after exposure to small amounts of carbon monoxide (CO) while other studies have found no decrement. To further test the effect of such exposure, four subjects were exposed to 75 and 150 parts per million of CO during sleep for 9 hours, producing mean carboxyhemoglobin levels of 5.9 and 12.7 percent. Sleep was monitored continuously through electrophysiological recording. Upon waking, subjects were given mental arithmetic, time estimation, tracking, monitoring, and visual tests. No performance decrements or differences from control conditions were found in any of the tests used. With respect to sleep patterns, subjects under CO had more deep sleep and less light sleep than in the control condition. Rapid-eye-movement sleep was not affected. It was concluded that, although certain CO effects occur in sleep, these are not great enough to affect performance and that for healthy well-motivated human subjects, these levels of CO do not produce performance decrements in the tasks used. (Auth. Abs.)

71-0971. Pestel, M. **Peut-on Fumer Sans Danger? [Can One Smoke Without Danger?]** *Vie Medicale* 52(25):3040-3041, July 1971, French.

Researchers have attempted to reduce the harmfulness of smoking because it is clear that many smokers will find reasons for justifying their habit. The present report briefly reviews the progress to modify the tobacco or the smoke. Filters can reduce the hazards to some degree. To this end, experiments are cited of dogs smoking seven unfiltered cigarettes daily for two and one-half years and in which two dogs developed human-type bronchial carcinoma; no dogs smoking filtered cigarettes under the same conditions developed such cancers. Possibilities of developing less harmful tobaccos include modifications of fertilizing practices, different methods of processing tobacco, and hybridization of tobacco varieties to develop tobaccos with a lower tar and nicotine content. Smokers who continue to smoke are currently advised to reduce their consumption of tobacco and not to inhale.

71-0972. Pirnay, F., Dujardin, J., Deroanne, R., Petit, J. M. **Muscular Exercise During Intoxication by Carbon Monoxide.** *Journal of Applied Physiology* 31(4):573-575, October 1971.

The metabolic, circulatory, and respiratory responses were analyzed during muscular exercises in which CO intoxication immobilized 15 percent of the hemoglobin. During moderate exercise, O_2 consumption was not modified and induced a ventilation comparable to that measured under normal conditions. On the other hand, the heart rate greatly increased from 128.1 to 142.7 beats/minute. This tachycardia appears to be the result of a much larger cardiac output brought about by the decrease in the oxygen carrying capacity of the blood. During maximal exercise, the maximal O_2 consumption was reduced 15.1 percent in spite of a much higher heart rate and a relative hyperventilation. This reduction of maximal O_2 consumption parallels the reduction of the O_2 transport possibilities of the blood. This thus provides a confirmation of the hypothesis that there is a circulatory limitation upon the maximal O_2 consumption. (Auth. Abs.)

71-0973. Portheine, F. **"Passivrauchen"-Nichtraucherschutz. ["Passive Smoking"-Nonsmoker Protection.]** *Medical Tribune* 18:(Unpaged), April 30, 1971, German.

The present material consists of statements by Portheine which had originally appeared in the *Munchener Medizinische Wochenschrift* and an exchange of correspondence concerning the substance of these statements. Portheine had briefly summarized the injurious effect of passive smoking on nonsmokers. He also accused the Forschungsinstitut der Zigarettenindustrie of burying their data concerning lung cancers induced in hamsters by passive smoking in an obscure American journal and of using invalid techniques in obtaining values for carbon monoxide and nicotine in smoked-filled areas. W. Dontenwill, who is the Director of the Forschungsinstitut, replies to the "false" charges and is again attacked by Portheine.

71-0974. Robert, A., Stowe, D. F., Nezamis, J. E. **Possible Relationship Between Smoking and Peptic Ulcer.** *Nature* 233(5320):497-498, October 15, 1971.

Since nicotine inhibits secretion of alkaline pancreatic juice, experiments using female Upjohn rats were conducted to determine if hydrochloric acid, perfused through the stomach, would not be neutralized and therefore lead to duodenal ulcer formation. In these experiments, 16 rats (Group I) were also infused subcutaneously with saline at the rate of 0.54 ml/hour, 14 rats (Group II) were infused subcutaneously with a solution of 20 micrograms/kg/minute of nicotine sulfate in saline at the rate of 0.54 ml/hour, and 12 rats (Group III) received the same amount of nicotine sulfate subcutaneously as Group II, but water instead of acid was perfused through the esophagus. When acid alone was perfused, duodenal ulcers were found in 31 percent of the animals. When nicotine sulfate was also given, the incidence reached 93 percent and the ulcers were more numerous and severe than those in Group I rats. Nicotine alone produced no ulcers. These results strengthen the hypothesis that nicotine sensitizes the duodenum to the ulcerogenic property of acid flowing from the stomach. If man reacts to nicotine as the rat does nicotine absorbed chronically through smoking may contribute to ulcer formation and to ulcer recurrences by reducing secretion of alkaline pancreatic juice via inhibition of secretin.

71-0975. Shibata, S., Hattori, K., Sanders, B. **The Relationship Between External Calcium Concentration and the Recovery Rate of Aortic Strips From Nicotine Tachyphylaxis.** *European Journal of Pharmacology* 16(1):109-112, September 1971.

In rabbit aortic strips, a repeated exposure to the same concentration of nicotine produced tachyphylaxis. Complete recovery occurred 50-60 minutes following the washout of the first application of nicotine. Incubation in medium containing norepinephrine (10^{-9} M) or dopamine (10^{-7} M) did not modify the time course of recovery. High Ca^{2+}-medium halved the recovery time and low Ca^{2+}-medium inhibited this process. Thus nicotine tachyphylaxis does not appear to be due to catecholamine depletion but rather to be a blockade of the adrenergic nerve effector site by depolarization which prevents norepinephrine release. (Auth. Abs.)

71-0976. Turnbull, M. J., Kelvin, A. S. **Cigarette Dependence. (Letter)** *British Medical Journal* 3(5766):115, July 10, 1971.

The 24-hour urinary excretion of adrenaline, the histamine metabolite 1-methylimidazole-4-acetic acid, and its isomer 1-methylimidazole-5-acetic acid was significantly higher in 22 smokers than in 21 smokers. These differences may be partly responsible for the withdrawal symptoms sometimes seen on stopping smoking. Apparently, the urinary excretion of these compounds is not immediately reversed upon cessation of smoking.

71-0977. Varga, E., Kovacs, L., Gesztelyi, I. **Analysis of the Depolarizing Effect of Nicotine on Frog's Skeletal Muscle.** *Acta Physiologica Academiae Scientiarum Hungaricae* 38(4):325-342, 1970.

The properties and mechanism of the slow depolarization induced by nicotine in the striated frog muscle may be outlined as follows. The depolarizing effect of nicotine depends on the concentration (maximum between .05 and .20 mM), on the site of measurement (maximum in the end-plate area) and on seasonal conditions (the effect is more marked from October to March than in spring or summer). The depolarizing effect is the most marked near the neuromuscular junction, may be inhibited by curarization, and in the aneural part of the muscle even a thousandfold of the otherwise effective nicotine concentration causes no depolarization. Thus, the neuromuscular junction is apparently the site of the depolarizing effect. Slow depolarization spreads exclusively in Ringer containing nicotine. The cause of slow depolarization appears to be an increase in the Na permeability of the membrane and about a 4.5-fold increase of ^{24}Na influx, on the average. Tetrodotoxin (TTX) at a concentration of 10^{-7} g/ml inhibits the spike propagation caused by nicotine in muscle fiber, but leaves the increase of ^{24}Na influx and slow depolarization unaffected. At a concentration of 5×10^{-6} g/ml TTX diminishes both the depolarization and the increase of ^{24}Na influx induced by nicotine. Nicotine increases ^{24}Na influx to the same extent at 0° C as at 20° to 23° C. (Auth. Abs.)

71-0978. Wang, I. Y., Marver, H. S., Rasmussen, R. E., Crocker, T. T. **Enzymatic Conversion of Benzo(*a*)pyrene. Hydroxylation vs DNA-Binding.** *Archives of Internal Medicine* 128(1):125-130, July 1971.

Hydroxylating and DNA-binding activity is increased in lung and liver microsomes after induction of enzyme activity by injecting benzo(*a*)pyrene (BaP) into intact rats. Overall enzymatic activity increases more in liver than in lung, and DNA-binding increases more than hydroxy product formation in microsomes from liver as compared to lung. Three major metabolites, detected by chromatography of a hexane-acetone extract after incubation of BaP labeled with tritium with preinduced liver microsomes, are reduced sharply by hematin at 5×10^{-5} M, and eliminated by 2.5×10^{-4} M. The greatest reduction was a peak identical with a standard sample of 3-hydroxy-BaP. Hematin reduced DNA-binding to a greater degree than metabolite production. This suggests that hematin interferes with metabolic conversion of BaP to a DNA-binding product. The latter product may be a precusor of 3-OH-BaP since both DNA-binding and 3-OH-BaP production are similarly suppressed. (Auth. Abs.)

71-0979. Wenzel, D. G., Azmeh, N., Clark, I. J. **Studies on the Acute and Chronic Depressor Actions of Nicotine in the Rat.** *Archives Internationales de Pharmacodynamie et de Therapie* 193(1):23-36, September 1971.

Chronic treatment of rats with 4.56 mg/kg/day of nicotine in the drinking water produced a depressor response, an augmented pressor action of norepinephrine, and a reduced pressor action of tyramine. In contrast, rats made acutely tolerant to the pressor effect of nicotine were subsensitive to both norepinephrine and tyramine. Pressor responses to the muscarinic ganglionic stimulants, McN-A-343, AHR-602, or physostigmine, were erratically affected by chronic treatment with nicotine. Pressor responses to DMPP, TMA, nicotine angiotensin, or vasopressin, however, were unaffected. Treatment with guanethidine, for 10 days, also sensitized rats to the pressor effect of norepinephrine and reduced the response to tyramine. It did not modify the response to any of the other pressor substances which had been tested in nicotine-treated rats. As with chronic nicotine treatment, guanethidine did not influence the development of renal hypertension in the rat but lowered the pressure to normal levels when it was administered during the secondary phase of renal hypertension. Treatment of normotensive or renal hypertensive rats with DMPP elevated the systolic pressure but did not produce the secondary depressor effect characterisitc of nicotine. The depressor effect of chronically-administered nicotine may not be the same as that which results from acute nicotinization. It is not the result of a block at nicotinic ganglionic receptors. (Auth. Abs. Mod.)

71-0980. Zavadina, S. P., Khesina, A. Y. **Toksicheskoe Deystviye i Metabolism Kantserogennykh Uglevodordov v Kul'turakh Normal'nykh i Opukholevykh Kletok Zolotistog Khomyaka. [Toxic Effect and Metabolism of Carcinogenic Aromatic Hydrocarbons in Cultures of Normal and Tumor Cells in Golden Hamsters.]** *Voprosy Onkologii* 17(7):62-66, 1971, Russian.

Normal and transformed hamster cells were cultivated in the medium containing aromatic hydrocarbons: 3,4-benzo(*a*)pyrene (BP) and 7,12-dimethylbenzanthracene (DMBA). Both hydrocarbons were metabolized by normal cells more intensively than by neoplastic ones. At the same time normal cells have proved to be more sensitive to the toxic effect of BP and DMBA. However, there is not always a correlation between cell sensitivity of transformed lines to BP and DMBA toxic effect and their metabolism of these compounds. (Auth. Abs.)

See also **71-0989, 71-0990, 71-1002, 71-1006, 71-1077**

MORTALITY AND MORBIDITY

71-0981. Ferris, B. G. (Jr.), Speizer, F. E., Worcester, J., Chen, H. Y. **Adult Mortality in Berlin, NH, From 1961 to 1967.** *Archives of Environmental Health* 23(6):434-439, December 1971.

The mortality experience of the adult population of Berlin, New Hampshire, did not show any overall excess, nor was there any significant difference in specific cause. No single best predictor of mortality could be identified. In general, a previous history of respiratory disease was a good predictor. It became much more so when associated with cigarette smoking, heart disease, gas exposure at work, and lowered pulmonary function. The relative role of these various factors could not be separated out with confidence because of the small numbers. (Auth. Abs.)

71-0982. Hirayama, T. **A Prospective Study on the Influence of Cigarette Smoking and Alcohol Drinking on the Death Rates for Total and Selected Causes of Death in Japan.** *Smoke Signals* 16(7):1-8, July 1970.

In a cooperative study of the National Cancer Center, the Institute of Public Health, and the prefectures of Miyagi, Aichi, Osaka, Hyogo, Okayama, and Kagoshima, a prospective study of 265,118 adults (males 122,261, females 142,857) has been in progress since late in 1965 in twenty-nine Health Center Districts. In the study area all persons aged over 40 in the 1965 census lists were interviewed. The response varied from 91.3 to 99.8 percent. Based on three full years' follow-up, a higher risk of cancer of the lung, esophagus, pancreas, liver, stomach, arteriosclerotic heart disease, peptic ulcer, and liver cirrhosis was found among cigarette smokers; a higher risk of cancer of the esophagus and liver cirrhosis was noted among daily alcohol drinkers. An addictive effect of risk factors was also observed, including a strikingly high risk for the combined habits of daily alcohol drinking and cigarette smoking in esophageal cancer. (Auth. Abs.)

71-0983. Pestel, M. **Tabac et Esperance de Vie. [Tobacco and Life Expectancy.]** *Presse Medicale* 79(46):2081-2082, October 30, 1971, French.

Until recent times, life expectancy at birth had risen very slowly, from 25 years in the seventeenth century, to 35 years in the eighteenth and to 43 years by 1880. From 1900 to 1956, the expectancy levels have risen more than 20 years, but have barely increased a year since then. In addition, life expectancy in females in 1950 was only 2.9 years higher than in males, but by 1965 this difference had amounted to 7.1 years. Life insurance companies attribute the slowing of the life expectancy curve and mortality differences in the two sexes to cigarette smoking, which is held responsible for an excess mortality of 150 percent. The actual mechanics by which smoking exerts its harmful influence is not discussed in the report. Smoking may only be a means of revealing latent hereditary differences but in the absence of specific data, the smoker would do well to discontinue smoking or to reduce his consumption.

71-0984. U.S. Department of Health, Education, and Welfare, Public Health Service. **The Health Consequences of Smoking. A Report of the Surgeon General: 1971.** U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration, Washington, D.C., DHEW Publication No. (HSM) 71-7513, 1971, 458 pp.

This report constitutes a comprehensive review of more than 20 years of research into the problem of smoking and health with emphasis on the most recent additions to the literature. Evidence is presented concerning the relationship between smoking and cardiovascular diseases, including coronary heart disease, cerebrovascular disease, nonsyphilitic aortic aneurysm, and peripheral vascular disease; cancer of the lung, larynx, oral cavity, esophagus, urinary bladder and kidney, and pancreas; birthweight and outcome of pregnancy; peptic ulcer; and tobacco amblyopia.

See also **71-0985**

NEOPLASTIC DISEASES

71-0985. American Cancer Society. **1972 Cancer Facts and Figures** American Cancer Society, Inc., 1971, 31 pp.

Some basic facts and figures on cancer in the United States, including statistics on morbidity and mortality, site and sex incidence, and survivability, are presented. The importance of early detection, trends in individual sites of cancer, ACS education programs concerning ways for individuals to protect themselves against cancer, and public attitudes toward cancer are discussed. Specific information is provided on cancers of the breasts, colon-rectum, lung, mouth area, skin, and uterus, as well as leukemia. Recent developments in the area of smoking and health, ACS antismoking efforts, and health costs of cigarette smoking are described. ACS activities in the area of cancer research, cancer prevention, clinical fellowships, service and rehabilitation, and the International Association of Laryngectomees are reviewed along with some of the economic aspects of cancer.

71-0986. Berg, J. W. **Epidemiology of the Different Histologic Types of Lung Cancer.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 93-104.

The several types of lung cancer show different epidemiologic patterns of occurrence. In general series, the pattern of distribution is characteristically that produced by moderate cigarette smoking. Industrially exposed individuals may be most prone to develop squamous cell carcinoma, oat cell carcinoma, or adenocarcinoma, depending upon the stimulus (e.g., chromate, radon (plus cigarettes), and asbestos, respectively), while cancers arising from scars are most often bronchiolar. (Auth. Abs.)

71-0987. Chaklin, A. **Oncological Research.** *Journal of the Indian Medical Association* 57(2):80-81, July 16, 1971.

Oncological research is reviewed in terms of the virusogenetical theory and the role of carcinogens. The incidence of cancer in different regions as affected by living conditions, habits and customs of the population is discussed with emphasis on tobacco chewing and smoking habits. The induction of tumors in test animals by benzopyrene injections and the connection between smoking and lung cancer are mentioned. Advances in oncogenesis, diagnosis and therapy are described.

71-0988. Churg, J., Kannerstein, M. **Occupational Exposure and Its Relation to Type of Lung Cancer.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 105-120.

Morphologic studies of occupational lung cancer demonstrate the existence of two forms: mesothelioma, which is rare and is quite specific for a particular carcinogen, in this instance asbestos, and pulmonary carcinoma, which is frequent and which is produced by a variety of substances. The role of cocarcinogenesis in the etiology of pulmonary cancer is briefly discussed. Epidemiological data and the similarity of histologic patterns to that of tobacco cancer suggest the possibility that cigarette smoke is the common cocarcinogen in the genesis of occupational lung cancer. (Auth. Abs.)

71-0989. Dao, T. L. **Inhibition of Tumor Induction in Chemical Carcinogenesis in the Mammary Gland.** In: van Duuren, B. L., Rubin, B. A., Homburger, F. (Editors). Progress in Experimental Tumor Research, Volume 14: Inhibition of Carcinogenesis. Basel, S. Karger, 1971, pp. 59-88.

Experiments are presented in which inhibition of tumor induction in the mammary gland by chemical carcinogen has been achieved by the following methods: (a) hormonal stimulation of target tissue; (b) hormonal deprivation of the host; and (c) administration of one of a variety of chemical compounds capable of stimulating drug-metabolizing enzyme systems. Ovarian hormones available in large amounts either by introduction of pregnancy or injections of the hormones shortly before carcinogen administration can effectively inhibit tumor induction. The unique structural similarity between steroid hormone and polycyclic aromatic hydrocarbon led to the suggestion that steroid hormone and carcinogenic polycyclics may compete for tissue-binding sites. Results indicated that to achieve effective inhibition of mammary tumor induction by DMBA, large amounts of steroid hormone must be either injected or made available by pregnancy before DMBA administration. This fact seems to support the postulate that one mechanism in the inhibiton of tumor induction is saturation of tissue-binding sites by steroid hormone to prevent subsequent binding with DMBA. Sufficient proof of this mechanism of inhibition however is not available.

71-0990. Falk, H. L. **Anticarcinogenesis–An Alternative.** In: van Duuren, B. L., Rubin, B. A., Homburger, F. (Editors). Progress in Experimental Tumor Research. Volume 14: Inhibition of Carcinogenesis. Basel. S. Karger. 1971, pp. 105-137.

It is not possible at this time to make sweeping recommendations regarding the introduction of anticarcinogenic chemicals in the interest of human protection. It should, however, become one of the areas of intensified research efforts directed toward acquisition of adequate information: (a) on the specificity of antagonists for certain groups of carcinogens. (b) for determination of the quantities of inhibitor required to abolish carcinogenic activty. (c) on the time relationship which must be met to obtain good results, particularly under circumstances where accidental exposure to high doses of a carcinogen had occurred, (d) on any ill-effects which may result from the use of enzyme inducers. thereby lowering desired drug or hormone levels. (e) on differential enzyme induction efficiency, and (f) on the inhibitory action of certain drugs, abolishing the desired enzyme activity. Much remains to be learned before anticarcinogenesis can be considered a reality, but efforts should be made to develop knowledge in this field and to plan a strategy for a concerted effort to utilize anticarcinogenic information for human protection. (Auth. Abs. Mod.)

71-0991. Ferrell, R. L., Carter W. S., Yarington, C. T. (Jr.) **Epidemiological Aspects of Oral Cancer.** *Eye, Ear, Nose and Throat Monthly* 50(10):386-390. October 1971.

The epidemiology of oral cancer is discussed with particular reference to the recognition of the relationship between certain commonly used carcinogens and an increased incidence of oral cancer. Various studies citing the roles of alcohol, tobacco smoking and snuff dipping as extrinsic factor in oral carcinoma are reviewed.

71-0992. Fischer, G. **Smoking Habits and Bladder Tumors. A Clinical Study.** Complete English translation of "Rauchgewohnheiten und Blasentumoren. Eine klinische Untersuchung," *Zeitschrift fur Urologie und Nephrologie* 64(4):271-274, April 1971.

To obtain precise anamnestic data on the smoking habits of patients with bladder tumors, questionnaires were given patients who were treated at the Urological Section of the Emperor Franz Joseph Hospital in Vienna from April 1, 1968 to December 31, 1969 and in the Urological Polyclinic of the University of Berlin-Steiglitz from January 1 to June 30, 1970. A total of 160 questionnaires were returned by patients with either a benign bladder papilloma or a bladder carcinoma. More than half of the patients suffering from bladder tumors were pronounced heavy smokers and only a very small part were nonsmokers, or expressed in percentages, 3 percent were nonsmokers, 28 percent were ex-smokers, 14 percent were light smokers and 55 percent were heavy smokers. By contrast, of the persons suffering benign prostatic hypertrophy, 24 percent were nonsmokers, 42.5 percent were ex-smokers, 17.5 percent were light smokers, and only 16 percent were heavy smokers.

71-0993. Gubinelli, C. **Considerazioni Statistico-Cliniche e Radioterapeutiche su 131 Casi di Neoplasie Maligne**

Broncogene. [Statistical, Clinical, and Radiotherapeutic Observations of 131 Cases of Malignant Bronchogenic Neoplasms.] *La Radiologia Medica* 56(12):1144-1154, December 1970, Italian.

A brief clinical and statistical account is given of 131 cases of malignant bronchogenic neoplasms observed over a period of 10 years. Simultaneous evaluation and objective improvement after radiotherapy showed that the best results were obtained with total tumor doses of 2500-3000 radians. A possible "aimed" treatment cycle pattern is discussed. In an effort to evaluate the relationship between smoking and age at incidence of the disease, and smoking and survival rates, each patient was classified according to the number of cigarettes smoked daily and the total duration of his smoking habit. There was a total of 49 nonsmokers (and occasional smokers), 34 moderate smokers, and 48 heavy smokers (those consuming over 30 cigarettes daily for a period of 30 to 40 years). Only the results from a comparison of the two extreme groups are reported. Heavy smokers had an incidence rate of three years prior to that of nonsmokers. Heavy smokers had a longer survival rate than nonsmokers. However, because of the small number of cases compared, a single subject with a very long survival rate could significantly change the total average for the group.

71-0994. Gulati, J., Bais, A. **Clinico-Pathological Study of Cancer of the Larynx.** *Antiseptic* 68(7):481-485, July 1971.

The results of a clinical and histopathologic study of 200 patients with laryngeal cancer are presented with special reference to the age of onset, duration, symptomatology, occupation, previous history of syphilis, tuberculosis, and septic focus. One of the most common predisposing factors was smoking and the chewing of pan, lime and tobacco, singly or in combination. The incidence of laryngeal cancer was 81 percent among smokers, 62 percent in pan chewers, and 15 percent in those who were both smokers and pan chewers.

71-0995. Kemp, R. **Patients and Cigarettes.** *Practitioner* 207(1238):215-220, August 1971.

Kingland's method of calculating lifetime totals of cigarettes smoked to determine the relative danger of smoking is discussed. The lung cancer rate was estimated to be 30 percent for smokers of over 500,000 cigarettes, 20 percent for 200,000 to 500,000 cigarettes, and 14 percent for under 200,000; nonsmokers have a 1.3 percent rate. Comparable patterns were found for the usual group of coronary disease, atherosclerosis, emphysema, chronic bronchitis, ulcers and cancers of the larynx, mouth and bladder. Kingland took the figure of 200,000 cigarettes in a lifetime as the threshold beyond which the danger increases significantly. But on the basis of lung cancer figures, most people would be more inclined to put the safety threshold at 100,000 cigarettes. Most patients feel they may be one of the fortunate ones who "gets away" with heavy smoking, but lung cancer is only one of the hazards and is not even the most common. Respiratory and coronary disease in relation to smoking is discussed followed by a description of a basic approach for physicians to persuade patients to stop smoking and some comments on the role of the physician, the smoking habit and the benefits of quitting.

71-0996. Lacassagne, A. **Alcohol and Cancer.** Complete English translation of "Alcool et Cancer," *Lutte Contre Cancer* 46(179):7-13, November-December 1969.

See **Abstract 70-0857**

71-0997. Leuchtenberger, C., Leuchtenberger, R. **Effects of Chronic Inhalation of Whole Fresh Cigarette Smoke and of Its Gas Phase on Pulmonary Tumorigenesis in Snell's Mice.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 329-346.

Exposure of male and female Snell's mice to chronic inhalation of puffs of whole fresh cigarette smoke or of its gas phase alone, for one year or longer, resulted in an earlier occurrence and a higher frequency of glandular pulmonary tumors when compared with those of controls. The enhancement of pulmonary tumorigenesis was particularly striking after exposure to the gas phase alone, and was more pronounced in males than in females. Males exposed to the gas phase disclosed not only a significant shift from pulmonary adenomas to adenocarcinomas, but the frequency of adenocarcinomas was 23 percent, that is, five times greater than that of controls, which was 4.7 percent. No bronchogenic carcinoma was observed in controls or in mice exposed to whole fresh cigarette smoke or its gas phase. (Auth. Abs.)

71-0998. Menakanit, W., Muir, C. S., Jain, D. K. **Cancer in Chiang Mai, North Thailand. A Relative Frequency Study.** *British Journal of Cancer* 25(2):225-236, June 1971.

The relative frequency of histologically diagnosed cancer at the Chiang Mai Medical School in North Thailand for 1964-67 inclusive is examined. Most of the 1877 cancers seen are in Thais (males, 927; females, 908), the remainder arising in Chinese (males, 21; females, 12), Hill People (males, 6; females, 1) and others (females, 2). In Thais, the outstanding finding is the extraordinarily high frequency of cancer of the hypopharyngeal-laryngeal region in both sexes (males, 18.4 percent; females, 3.4 percent). This may be associated with the smoking of a local variety of the cigar called "keeyo". This cigar, smoked in the usual manner, contains approximately equal quantities of home-grown, sun-dried, Thai tobacco and the chopped bark of the "koi" tree (*Streblus asper*). In women, who also smoke "keeyo", the frequency of hypopharyngeal-laryngeal cancer is unusually high by occidental standards. There is no sex difference in the frequency of bronchial cancer (4 percent). In males, cancer of the penis ranks second and is much more frequent than cancer of the prostate and testis combined. Stomach and skin cancers are in third place. In females the most frequent cancers are cervix uteri, breast, and skin. Cancers of the lip and skin of the head and neck are more frequent in females than in males. Choriocarcinoma is common and there is a large number of vulvar cancers in young women. The geography, economy and medical facilities of Chiang Mai Province are described. Although there is likely to be considerable under-reporting of internal cancers, the high frequency of hypopharyngeal-laryngeal cancer is not due to selective bias. (Auth. Abs. Mod.)

71-0999. Park, J. F., Howard, E. B., Stuart, B. O., Wehner, A. P., Dilley, J. V. **Cocarcinogenic Studies in Pulmonary Carcinogenesis.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 417-436.

Cocarcinogenic experiments are currently in progress to determine the pathogenesis of several potentially carcinogenic materials on the induction of pulmonary neoplasia in experimental animals. The role of plutonium-induced lymphopenia and lymphatic pathology is being evaluated in the pathogenesis of pulmonary neoplasia induced by inhalation of plutonium dioxide in beagle dogs. Hamsters and dogs are being exposed to combinations of uranium mine air contaminants including radon daughters, uranium ore dust, diesel engine exhaust, and cigarette smoke. The cocarcinogenicity of inhaled asbestos, nickel oxide, cobalt oxide, and cigarette smoke is being investigated in hamsters. (Auth. Abs.)

71-1000. Richter, C. B. **Application of Infectious Agents to the Study of Lung Cancer: Studies on the Etiology and Morphogenesis of Metaplastic Lung Lesions in Mice.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 365-382.

Squamous metaplasia of the bronchial epithelium and lung parenchyma was observed in spontaneously infected DBA/2 mice. Transmission studies employing clinical material segregated two pathogenic agents: mycoplasma and a paramyxovirus. Experimental superinfection employing these two agents resulted in reproduction of the clinically observed lesion characterized by high mitotic indices in metaplastic tissue. Electron microscopy was used to study the fine structure changes and localization of the infectious agents. The potential role of the induced lesion in experimental lung cancer is mentioned. (Auth. Abs.)

71-1001. Roth, D., Oppenheim, A. **Synergistic Effect of Mutagens and Incorporated DNA In Vitro. Analogy for Buccopharyngeal Cavity.** *Archives of Environmental Health* 22(4):482-486, April 1971.

Purified calf thymus DNA was incorporated, to saturation limits, into cultured hamster embryo cells. The cells were then exposed to carcinogenic and noncarcinogenic diepoxides and aromatic hydrocarbons. All tested cultures converted to permanent cell lines, exhibiting loss of contact inhibition. Tumors were not induced in compatible animals inoculated with converted cells. Control cultures (untreated, DNA-treated only and chemical agent-treated only) failed to convert and degenerated. The incorporated, inactive DNA may have competed against cellular DNA for limited amounts of intracellular substances required for repairing genetic damage caused by the chemical agents. By analogy, massive invasion of buccopharyngeal epithelium by DNA viruses concurrently with exposure to environmental mutagens, such as in heavy smoking, might act as cofactors to potentiate carcinogenesis in the human buccal cavity and oropharynx. (Auth. Abs. Mod.)

71-1002. Rubin, B. A. **Alteration of the Homograft Response as a Determinant of Carcinogenicity.** In: van Duuren, B. L., Rubin, B. A., Homburger, F. (Editors). Progress in Experimental Tumor Research, Volume 14: Inhibition of Carcinogenesis Basel, S. Karger, 1971, pp. 138-195.

The purpose of these investigations was to determine the relevance of the carcinogen-induced tolerance phenomenon to the process of actual carcinogenesis. This was sought by direct comparisons, qualitative and quantitative, between the ability of carcinogens to affect the two types of responses in the same inbred animals. From the studies of the interactions between substances that enhance or inhibit carcinogens, it was possible to derive some evidence of the mechanism of carcinogen action and some insight into possible methods of prophylaxis. Further, it was possible to show that the homograft tolerance assay is a meaningful, sensitive (and rapid) technique for detecting potential carcinogens as well as anti-carcinogens. The comparison with leukemogenesis not only showed the remarkable correlation between these two carcinogen activities, but also established the system of induced leukemia in DBA/2 mice as a highly reliable and sensitive technique for the assay of the polycyclic hydrocarbon carcinogens.

71-1003. Rusk, H. S. **How Smoking Causes Lung Cancer.** *Rocky Mountain Medical Journal* 68(10):37-39, October 1971.

A new etiology of lung cancer is presented without absolute proof. However, circumstantial evidence points to the possibility that tissue dryness and vasoconstriction from nicotine produce cellular changes in areas of the respiratory tract most exposed to dryness. These same areas are the most frequent sites of lung cancer (Auth. Abs.)

71-1004. Saccomanno, G., Saunders, R. P., Archer, V. E., Auerbach, O., Brennan, L. **Metaplasia to Neoplasia.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 63-80.

A histological study of the tracheobronchial tree and sputum cells of six cases of cancer of the lung is presented. These six patients are divided into three groups according to toxic inhalant exposure. Two patients had long exposure to radon in uranium mines, two had long-term exposure to radon plus cigarette smoke, and two were long-time heavy cigarette smokers. All developed cancer of the lung. An attempt was made to match cells found in sputum prior to the time of surgery or death with sections showing similar cell patterns. An attempt was also made to correlate or show relationships of types of metaplasia seen in each group and to correlate this with final tumor product. The metaplasia seen in the patients exposed to cigarette smoke and radon are similar, and the tumorous final product is preceded by a histologically related metaplastic cell development. (Auth. Abs.)

71-1005. Smith, W. E., Miller, L., Churg, J. **An Experimental Model for Study of Cocarcinogenesis in the Respiratory Tract.** In: Nettesheim, P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors). *Morphology of Experimental Respiratory Carcinogenesis.* Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, pp. 299-316.

Data are presented on yields, times of observation, and types of tumors in the respiratory tracts of hamsters after intratracheal injections of different doses of benzo(*a*)-pyrene suspended in 1 percent Tween 60. These data afford base-line information for studies of promotion or inhibition of carcinogenesis in the respiratory tract by other substances. Addition of chrysotile to intratracheal injections of benzo(*a*)pyrene did not appreciably alter incidence of papillomas in the larynx, trachea, and extrapulmonary bronchi, but did increase incidence of tumors in the lungs. Some possible mechanisms are discussed. (Auth. Abs.)

See also **71-0958, 71-0973**

71-1006. Wattenberg, L. W. **The Role of the Portal of Entry in Inhibition of Tumorigenesis.** In: van Duuren, B. L., Rubin, B. A., Homburger, F. (Editors). Progress in Experimental Tumor Research, Volume 14: Inhibition of Carcinogenesis. Basel, S. Karger, 1971, pp. 89-104.

The induction of increased microsomal enzyme activity results in the inhibition of carcinogenesis due to exposures to a variety of chemical carcinogens. Thus, these enzyme systems have the capacity to exert a protective effect against chemical carcinogens. Substantial studies of the distribution of one group of the microsomal enzyme systems, the polycyclic hydrocarbon hydroxylases, have been carried out. In addition to their occurrence in other tissues, polycyclic hydrocarbon hydroxylases occur in the major portals of entry. Their activity in the lung and small intestine is quite labile, being altered by diet as well as by defined chemical inducers. Studies which have been carried out in the rat suggest that most, and possibly all, of the polycyclic hydrocarbon hydroxylase activity in these two tissues is due to exposure to exogenous inducers. It is difficult at present to assess the implications of the above findings for man. If the activity of microsomal enzyme systems in the portals of entry of man show the same characteristics as those of the animals studied thus far, then the response of individuals to chemical carcinogens may be determined to a significant extent by exposures to exogenous inducers. (Auth. Abs. Mod.)

NON-NEOPLASTIC RESPIRATORY DISEASES

71-1007. Camner, P., Philipson, K., Arvidsson, T. **Cigarette Smoking in Man. Short-Term Effect on Mucociliary Transport.** *Archives of Environmental Health* 23(6):421-426, December 1971.

The short-term effect of cigarette smoke upon mucociliary transport has been studied with a test aerosol of 6- to 7-micron monodisperse particles and by external measurement of the particles. The particles were produced from fluorinated ethylene propylene using a spinning disk technique and tagged with technetium 99m. The speed of mucociliary transport in a group of smokers was significantly higher during intensive cigarette smoking than when they were not smoking (half-lives averaged 22.8 and 43.9 minutes respectively). On the average, tracheobronchial clearance diminished in the same persons when they had abstained from smoking for one week; however, the decrease was not significant.(Auth. Abs.)

71-1008. Camner, P., Philipson, K. **Humanstudier av Tracheobronchiell Clearance med Monodispersa Teflonpartiklar Markta med ^{18}F och ^{99m}Tc. [Tracheobronchial Clearance in man studied with Monodispersed Teflon Particles tagged with ^{18}F and ^{99m}Tc.]** *Nordisk Hygienisk Tidskrift* 52:1-9, 1971, Norwegian.

Tracheobronchial clearance was studied with a test aerosol of monodisperse teflon particles tagged with ^{18}F and ^{99m}Tc. Because of the reproducibility of the clearance pattern in the same subject, it was possible to study the acute effect of different agents on mucociliary transport. The acute effect of tobacco smoke in five subjects was an increase of mucociliary transport. One week after the subjects had quit smoking, they showed a slower clearance. The clearance pattern of one heavy smoker with slight symptoms of bronchitis was affected by coughing. In two subjects, the clearance patterns were studied when different flow rates in the inhalations of the test aerosol were used. Clearance was largely dependent upon the flow rates.

71-1009. Chwat, M., Mordish, R. **Hafra'ot Bedarkhe Haneshima Uvisinusis 'ezel 'Ovdim Bemispar Mif'ale Kutna Beyisra'el. [Respiratory Symptoms and Byssinosis Among Textile Workers in Israel.]** *Harefuah* 80(10):559-562, 586-587, May 16, 1971, Hebrew.

Respiratory symptoms and byssinosis were investigated in 257 Israeli men who worked in cotton mills and in 64 controls who were members of the Israel Philharmonic Orchestra. Among the controls, 38 were smokers. Smoking was a significant factor which increased the prevalence of respiratory complaints. The severity of respiratory symptoms increased with age. Of the cotton workers, 174 complained of respiratory symptoms. Of these, 165 were smokers, but the nonsmokers had similar complaints. Pulmonary function values were significantly lower among the cotton workers than the controls. Among the cotton workers, exposure to dust was the most important factor causing respiratory symptoms, while other factors such as aging and smoking were of minor significance. The prevalence of respiratory symptoms and of byssinosis was related to work in departments with a marked dust hazard.

71-1010. Coudray, P., Serise, M., Freour, P. **Epidemiological Research on Chronic Bronchitis and Respiratory Insufficiency. Study of Prevalence in a Sample of Women From 30 to 70 Years.** Complete English translation of "Recherche Epidemiologique sur les Bronchites Chroniques et les Insuffisances Respiratoires. Etude de Prevalence Dans un Echantillon de Femmes de 30 a 79 Ans," *Revue de Tuberculose et de Pneumologie* 33(6):769-780, September-October 1969.

See **Abstract 71-0436.**

71-1011. Douglas, F. G., Kafilmout, K. J., Patt, N. L. **Foreign Particle Embolism in Drug Addicts: Respiratory Pathophysiology.** *Annals of Internal Medicine* 75(6):865-872, December 1971.

Three of seven intravenous-drug addicts had radiological, pathological, and functional manifestations of pulmonary foreign body emboli and granulomas; three others had abnormal pulmonary function without clinical or radiological evidence of respiratory disease. In the seventh case there was necropsy evidence of foreign body granulomas in the lungs. The first six patients had reduced diffusing capacities, and the three with proved granulomas also had increased elastic recoil of lungs. Thus, the ultimate effect of foreign body embolism on lung function is reduction in diffusion and compliance, presumably caused by the extravascular, interstitial spread of granulomas. Although embolic and granulomatous foreign body disease has not been proved in three cases, their diminished diffusing capacities may be early evidence of its presence. Early detection may prevent progression to chronic respiratory disease. (Auth. Abs.)

71-1012. Durda, M., Szafranski, W. **Przewlekle Nieswoiste Choroby Pluc Wsrod Ludnosci Wiejskiej Woj Lubelskiego. [Chronic Non-specific Diseases of the Lung Among the Rural Population of the Lublin Province.]** *Gruzlica i Choroby Pluc* 39(7):616-620, July 1971, Polish.

The investigation based on a World Health Organization questionnaire covered the rural population (237 men, 286 women) aged from 30 to 65 years. The smoking habit was established in one-third of the individuals, almost all of whom were men (only three smokers were women), with 6.7 percent of these smoking more than 20 cigarettes per day. Chronic nonspecific pulmonary disease was found in 15.2 percent of the population, simple chronic bronchitis in 11.8 percent, chronic bronchitis with airway obstruction in 2.6 percent, and obturation without characteristics of chronic bronchitis in 0.8 percent. In persons over 40, the disorders were four times more frequent than in those between 30 and 39. The incidence in men was 9.5 times higher than in women, and 11.5 times higher in smokers than nonsmokers. A relationship was found between the number of cigarettes smoked per day and the incidence of disease. Factors having a harmful effect on respiratory function encountered in the farmers (99.9 percent of the population) have less influence on the incidence of disease than smoking.

71-1013. Egle, J. L. (Jr.) **Single-Breath Retention of Acetaldehyde in Man.** *Archives of Environmental Health* 23(6):427-433, December 1971.

The single-breath retention of acetaldehyde vapor by the respiratory tract of human subjects was measured. Experiments were performed in which the volume inhaled and duration of inhalation and exhalation were varied. Some experiments involved breath holding of various time intervals. A direct relationship was found to exist between the volume inhaled and the percent taken up. There was an inverse relationship between rate of inhalation and retention. At all inspiratory rates and tidal volumes, there was an increase in retention as breath-holding time became longer. The humidity of the inhaled vapor had no effect on acetaldehyde retention. Although several factors were found to affect uptake, the volume inhaled is the most important in determining single-breath retention. (Auth. Abs. Mod.)

71-1014. Fournier, E., Zivy, P. **Lung and Tobacco.** Complete English translation of "Poumon et Tabac" *Poumon et le Coeur* 26(9):1109-1125, 1970.

See **Abstract 71-0441.**

71-1015. Gross, P. **Some Aspects of Pneumoconiosis.** *Pathology Annual* 6:61-79, 1971.

Pulmonary clearance of dust proceeds along two pathways. The physiologic mechanism consists of a mucociliary "escalator" and alveolar clearance. Pathological clearance consists of lymphatic transport of dust which has penetrated the alveolar membrane to satellite lymph nodes. Macrophages help to aggregate otherwise diffusely distributed dust particles. Failure of the pulmonary clearance mechanism is 1) relative as when more dust is inhaled than can be removed by the clearance mechanism such as occurs in pneumoconiosis, or 2) absolute as when the clearance mechanism becomes defective because of a congenital or acquired abnormality such as in alveolar proteinosis. The respiratory bronchiole is the locus of clearance failure as evidenced by productive inflammatory changes produced by various pulmonary irritants concentrated there. Alveolar septal destruction induced experimentally with papain resembles centrilobular emphysema. Centrilobular emphysema may be due to an inadequate inhibition of endogenous enzymes such as occurs in alpha-antitrypsin deficiency. Cigarette smoke may also vitiate antienzymatic activity locally, thereby resulting in alveolar destruction. An excessive amount of inhaled dust can lead to atelectasis in the alveolar ducts or respiratory bronchioles which sequester the dust. However, these sequestered dust deposits can be slowly mobilized or demineralized by edema fluid. The inflammatory response of the alveolar membrane to inhaled insoluble particulates is due to its mesodermal origin and to an avascularization process. Two types of coal worker's pneumoconiosis (CWP) are recognized, the simple and the complicated (also known as progressive massive fibrosis). The conversion of simple to complicated CWP by infections with acid-fast bacteria is in many respects similar to the well-known synergistic effect of tuberculosis upon silicosis. There is a somewhat higher prevalence of respiratory symptoms and less effective lung function suggestive of chronic bronchitis in miners and ex-miners as compared to non-miners, but this difference is probably caused by environmental factors not related to mining. Although smoking patterns of coal miners differ from other workers because of the smoking prohibition in mines, cigarette consumption is about the same as that of the general population. A relationship between lung function disturbance and duration of coal dust exposure has been found in smoking miners as compared with nonsmoking miners. Thus cigarette smoking seems more important in the production of chronic bronchitis and emphysema than the inhalation of coal dust.

71-1016. Langlands, J.H.M., Wallace, W.F.M., Simpson, M.J.C. **Insulation Workers in Belfast. 2. Morbidity in Men Still at Work.** *British Journal of Industrial Medicine* 28(3):217-225, July 1971.

Two hundred and fifty-two (93 percent) of the insulation workers in Belfast were examined by chest x-ray, questionnaire, clinical examination, and tests of respiratory function. The frequency of chest x-ray abnormality, lung field or pleural, increased from 13 percent in men who had worked for less than 10 years to 85 percent in men who had worked for 30 or more years in the industry. Pleural calcification was found in 15 x-rays. There was evidence suggesting that some men had pleural fibrosis or calcification due to exposure to asbestos in childhood. Rales were present in 61 percent and clubbing in 11 percent of men with lung field abnormality, but these were not common when the x-rays showed only pleural abnormality. Where the lung fields were involved there was a restrictive defect with impairment in lung function most marked in the forced vital capacity and single breath carbon monoxide transfer factor, but where the pleura was involved without lung field involvement there was a tendency to impairment of ventilatory function with a normal transfer factor. There was considerable impairment of lung function in smokers compared with nonsmokers; there was a lower mean FVC and Tl in smokers with normal chest x-ray than in nonsmokers with lung field abnormality in their chest x-ray. Smoking and exposure to asbestos have an additive effect in causing impairment of lung function in respect to vital capacity and gas transfer, as well as in causing lung cancer.

71-1017. Laurell, C.-B. **Is Emphysema in Alpha$_1$-Antitrypsin Deficiency a Result of Autodigestion?** *Scandinavian Journal of Clinical and Laboratory Investigation* 28(1):1-3, September 1971.

An alpha$_1$-antitrypsin content below 60 percent/100 ml serum is a characteristic of the inherited type of alpha$_1$-antitrypsin deficiency. Such individuals are homozygous for the Pi^Z gene, which results in the formation of alpha$_1$-antitrypsin molecules in abnormally small amounts and with lower than normal charge. An early manifestation of emphysema without preceding bronchial or pulmonary disorders is common in PiZZ subjects. There is an early diminution of lung elasticity. This may be due to an elastolytic attack on nonpolar residues of the elastin fibers which removes their outer shell and impairs elasticity. Some evidence suggests that the mean collagen elastin ratio in lung tissue is higher in PiZZ subjects. Inhalation of papain aerosols has induced emphysematous lesions in laboratory animals. Proteolytic enzymes have been recovered from the sputa of subjects with emphysema and/or bronchiectasis and may originate from alveolar macrophages or from polymorphonuclear leucocytes. The two plasma proteins, alpha$_1$-antitrypsin and alpha$_2$-macroglobulin, probably protect us against these proteolytic enzymes. In alpha$_1$-antitrypsin deficiency, anything causing increased sequestration and destruction of polymorphonuclear leucocytes or increased macrophage activity in the lungs is potentially dangerous. This includes all types of air pollution, such as tobacco smoke.

71-1018. Leuchtenberger, C., Leuchtenberger, R. **Einfluss von frischem Zigarettenrauch auf die Entwicklung von Lungentumoren und auf Lungenkulturen bei der Snell-Maus. [Influence of Fresh Cigarette Smoke on the Development of Lung Tumors and on Lung Cultures in Snell Mice.]** *Schweizerische Medizinische Wochenschrift* 101(38):1374-1380, September 25, 1971, German.

Chronic inhalation of whole fresh cigarette smoke, or of its gas phase alone resulted in earlier occurrence and higher frequency of lung tumors in Snell's mice. This enhancement of pulmonary tumorigenesis was particularly striking after exposure to the gas phase alone, and more pronounced in males than in females. No bronchogenic carcinoma was observed, but the pulmonary tumors were adenomas and adenocarcinomas a histological type of pulmonary tumor which occurs at a lower frequency and at a later age in Snell's controls. Lung explant cultures which were exposed to whole charcoal-filtered cigarette smoke, from which cytotoxic factors were nearly all eliminated, showed after exposure to this "non-toxic" cigarette smoke a selective damage to the alveolar macrophages. After exposure of lung explant cultures to the gas phase from charcoal-filtered cigarette smoke, the alveolar macrophages showed a selective stimulation of DNA synthesis. These results indicate, on one hand, the importance of particulate matter for the inhibition of cell metabolism, and on the other hand, the importance of the gas for the stimulation of cell metabolism of alveolar macrophages.

71-1019. Leuchtenberger, C., Leuchtenberger, R. **Morphological and Cytochemical Effects of Marijuana Cigarette Smoke on Epithelioid Cells of Lung Explants From Mice.** *Nature* 234(5326):227-229, November 26, 1971.

Lung explants from Snell's and C57BL mice were prepared on coverslips and exposed to puffs of smoke from cigarettes prepared with tobacco alone and with the same tobacco mixed with marijuana (0.5 g). Two types of marijuana were used, one containing 0.4 percent tetrahydrocannabinol (THC) and one containing 4 percent THC. Cigarette smoke with marijuana evoked morphological and cytochemical alterations in epithelioid cells of the lung explants, such as atypism, mitosis, and DNA synthesis, to a significantly higher degree than cigarette smoke without marijuana. The observation that the higher concentration of THC in marijuana cigarette smoke evoked earlier and more marked alterations, including higher DNA content, suggests that THC is at least partly responsible for the alterations.

71-1020. Motley, H. L. **Environmental Air Pollution Effect on Pulmonary Function.** *Aerospace Medicine* 42(10):1108-1110, October 1971.

Air pollution aggravates preexisting respiratory and circulatory conditions in man. Oxidants, oxides of nitrogen and sulfur, carbon monoxide and particulates are the more important pollutants increasing airways resistance and bronchospasm and impairing oxygen transfer and transport in the lungs and blood with hypoxia. Significant changes in pulmonary function measurements occur from breathing smoggy air in Los Angeles and similar changes occur from cigarette smoking. The allergic aspect is an important factor in many patients. A significant increase in arterial oxygen pressure occurs in some patients on 100 percent oxygen breathing with intermittent positive pressure breathing (IPPB) as compared to ambient 100 percent oxygen breathing indicating small collapsed areas at the alveolar level perfused with blood but not ventilated, but which can be opened up with the IPPB (microatelectasis). Lack of surfactant appears a possible factor. Cigarette smokers have high arterial carbon monoxide hemoglobin saturation, three to four times that of nonsmokers even in Los Angeles. Cigarette smoking presents a far greater hazard from carbon monoxide for flying personnel and cardiorespiratory patients than breathing the Los Angeles smoggy air. (Auth. Abs.)

71-1021. Nikodemowicz, E., Sawicki, F., Janczy, S., Czajkowska, L., Pawlikowska, L., Piotrowska, B. **Gruzlica Pluc i Objawy Kaszlu i Odkrztuszania Wsrod Mieszkancow Krakowa. [Pulmonary Tuberculosis and Cough and Expectoration in Inhabitants of Krakow.]** *Gruzlica i Choroby Pluc* 39(7):595-603, July 1971, Polish.

The present analysis included persons examined at the epidemiological survey of inhabitants of Krakow in 1968. The incidence of chronic cough and expectoration was investigated in persons in whom pulmonary tuberculosis, either active or healed, was suspected (on the basis of data from past history, changes on miniature films or standard roentgenograms), as well as in those in whom tuberculosis was diagnosed. It was found that in tuberculous patients as well as in persons in whom pulmonary tuberculosis was suspected, the incidence of cough and expectoration was higher than in persons in whom tuberculosis was either not suspected or was excluded. The majority of the observed chronic manifestations should be ascribed to the effect of smoking. Smoking was more frequent and the number of cigarettes higher in persons in whom tuberculosis was suspected as well as in tuberculous patients. The manifestations were particularly frequent among those who have smoked for over 20 years. (Auth. Abs.)

71-1022. Okajima, Y. **Shigaretto-en Choki Hampaku Bakuro no Kido Semmo Undo ni Oyobosu Eikyo. [Long-Term Effect of Cigarette Smoking on Ciliary Activity.]** *Journal of the Nagoya City University Medical Association* 21(4):1022-1046, February 1971, Japanese.

Repeated exposure of rabbits to cigarette smoke markedly decreased the cleansing activity of the cilia. There was an inverse relation between this decrease and the blood carboxyhemoglobin content and a direct relation with the blood cell count and hematocrit.

71-1023. Powell, G. M., Green, G. M. **Investigation on the Effects of Cigarette Smoke on Rabbit Alveolar Macrophages.** *Biochemical Journal* 124(2):26P-27P, September 1971.

Experiments showed that the activity of crystalline rabbit muscle glyceraldehyde 3-phosphate dehydrogenase was inhibited after exposure to the filtered gas phase of cigarette smoke and aqueous extracts thereof, that the degree of inhibition was dependent on the preincubation period and on the relative concentration of the filtered gas phase, and that in the presence of cysteine (2.5 micromoles/8 ml of filtered gas phase) there was no significant inhibition of activity. Further experiments showed that glyceraldehyde 3-phosphate dehydrogenase activity in incubated rabbit alveolar macrophages was inhibited by the filtered gas phase and that the extent of inhibition was dependent on the concentration of the filtered gas phase. There was no decrease in enzyme activity in the presence of the filtered gas phase when cysteine was added to the incubation mixtures. These findings are consistent with a thiol-blocking role for filtered gas phase, with particular reference to the activity of glyceraldehyde phosphate dehydrogenase, suggesting a relationship between macrophage phagocytic competence and loss of enzyme activity.

71-1024. Pudelski, J., Oklek, K., Deloff, L. **Obraz Epidemiologiczny Przewleklych Nieswoistych Chorob Pluc u Mieszkancow Miasta Zabrza. [Epidemiological Situation of Chronic Non-specific Diseases of the Lung in Inhabitants of the Town of Zabrze.]** *Gruzlica i Choroby Pluc* 39(7):604-609, July 1971, Polish.

Epidemiological investigations were conducted on the incidence of manifestations of chronic nonspecific bronchopulmonary disease in men ages 40 to 60 in Zabrze, an industrial town with a high atmospheric pollution level (360 micrograms/m^3). Of the 1190 men examined (over 90 percent of the population), 76 percent were smokers and 84 percent worked exposed to dust. The results showed chronic cough in 29 percent, expectoration in 21.7 percent, cough and expectoration in 20 percent, grade II dyspnea in 22 percent, and grade III dyspnea in 11.6 percent. Spirographic signs of obturation were present in 18 percent and were more frequent and more severe in older-age groups.

71-1025. Rode, A., Shephard, R. J. **Smoking Withdrawal and Changes of Cardiorespiratory Fitness.** *American Review of Respiratory Disease* 104(6):933-935, December 1971.

The immediate changes of cardiorespiratory fitness that accompanied a smoking withdrawal program included reduction of resting and exercise pulse rates and the elimination of carbon monoxide from the blood with a half-time of 3.7 hours in the men and 2.5 hours in the women. During a one-year interval there was little improvement of absolute aerobic power, and there was a diminution of relative aerobic power. Factors having an adverse effect on fitness included a substantial increase of body fat and a reversal of the carbon-monoxide induced polycythemia. Smoking withdrawal clinics should offer a total approach to health, including advice on diet and increased physical activity. (Auth. Abs.)

71-1026. Rylander, R. **Lung Clearance of Particles and Bacteria. Effects of Cigarette Smoke Exposure.** *Archives of Environmental Health* 23(5):321-326, November 1971.

The ability of the lung to clear particles and viable bacteria was studied in guinea pigs exposed to cigarette smoke. The animals were given ten puffs of fresh cigarette smoke from one to four cigarettes daily during one to four weeks. They were then exposed to a mixed aerosol of killed radioactive and viable *Escherichia coli*. The clearance of radioactive and viable bacteria was determined– the former being an indicator of the mucus clearance and the latter, of the phagocytic activity of the lung. Smoke from cigarettes of high and medium tar content was found to decrease both mechanical and bactericidal clearance. After shorter exposure times, the results indicate that the mechanical clearance flow is affected earlier than the bactericidal clearance. When phenylmethyloxadiazole was added to the tobacco by 2 percent by weight, an effect on the mechanical or bactericidal clearance could not be demonstrated. (Auth. Abs.)

71-1027. Stebbings, J. H. (Jr.). **Chronic Respiratory Disease Among Nonsmokers in Hagerstown, Maryland. III. Social Class and Chronic Respiratory Disease.** *Environmental Research* 4(3):213-232, August 1971.

The relationships of respiratory symptoms and pulmonary function to social class in a population of white male nonsmokers are presented. Among the symptoms only dyspnea (grade 2+) was found to vary in prevalence with social class, being less common among respondents in white collar occupations whose fathers were white collar workers. This is consistent with the hypothesis that dyspnea grade 2 is primarily a cardiovascular symptom. The forced expiratory volume in one second ($FEV_{1.0}$) and the peak expiratory flow rate (PEFR) were positively correlated with social class. This effect was of the order of ±0.21 liter for the $FEV_{1.0}$ and ±22 liter/minute for the PEFR. Upward social mobility had no effect on the pulmonary function values. (Auth. Abs.)

71-1028. Valic, F., Zuskin, E. **Effects of Hemp Dust Exposure on Nonsmoking Female Textile Workers.** *Archives of Environmental Health* 23(5):359-364, November 1971.

Symptoms of byssinosis were found in 39 percent of 102 female hemp workers who were nonsmokers. The effects of smoking on the respiratory tract were excluded by selecting a homogeneous group of nonsmoking workers. A higher prevalence of chronic bronchitis (P less than 0.01) was found in workers with symptoms of byssinosis than in those without such symptoms. In hemp workers, either with or without symptoms by byssinosis, $FEV_{1.0}$ and FVC significantly decreased during work on the study days, Mondays and Thursdays; significantly lower reductions were registered on Thursdays. Inhalation of metaproterenol sulfate (Alupent) before work significantly diminished $FEV_{1.0}$ reduction, although not completely preventing it. Metaproterenol inhalation after work significantly increased $FEV_{1.0}$, indicating the reversibility of acute lung function changes during work. Comparison of lung function values measured before work with values obtained in the control group indicates a chronic effect of hemp dust on ventilatory function. (Auth. Abs. Mod.)

71-1029. Wallace, W.F.M., Langlands, J.H.M. **Insulation Workers in Belfast. 1. Comparison of a Random Sample With a Control Population.** *British Journal of Industrial Medicine* 28(3):211-216, July 1971.

A sample of 50 men was chosen at random from the population of asbestos insulators in Belfast and matched with a control series of men of similar occupational group with respect to age, height and smoking habit. With respect to smoking habit, 13 of the men were nonsmokers, 9 were ex-smokers and 28 were smokers. Significantly more of the insulators complained of cough and sputum and had basal rales on examination. Clubbing was assessed by means of measurements of the hyponychial angle of both index fingers. These angles were significantly greater in the group of insulators. Twenty-one insulators had X-rays which showed pleural calcification with or without pulmonary fibrosis; one control X-ray showed pulmonary fibrosis. The insulators had no evidence of airways obstruction but static lung volume was reduced and their arterial oxygen tension was lower than that of the controls and their alveolar-arterial oxygen gradient was greater.

71-1030. Zivy, P. **Pneumothroax des Fumeurs et Poumon Tabagique. [Smokers' Pneumothorax and Tobacco Lung.]** *Entretiens de Bichat. Medecine et Biologie* 1971, pp. 267-272, French.

The important role which tobaccoism plays in the development of spontaneous idiopathic pneumothorax is discussed based on a brief review of previously published results. The incidence of the disease before the age of 25 and the type of cases observed can be clearly distinguished from the type of cases observed in subjects over 25 years of age. In the latter, incidence is greater among heavy smokers with a high daily consumption and a prolonged smoking habit. Differences observed in the rate of incidence of the disease may be due to existing differences in inhalation and level of consumption in smokers. The increased incidence observed in the past 70 years may be attributed to a parallel increase in tobacco consumption.

See also **71-0972, 71-0995**

CARDIOVASCULAR DISEASES

71-1031. Aronow, W. S., Rokaw, S. N. **Carboxyhemoglobin Caused by Smoking Nonnicotine Cigarettes. Effects in Angina Pectoris.** *Circulation* 44(5):782-788, November 1971.

The effects of increased carboxyhemoglobin levels caused by smoking nonnicotine cigarettes upon exercise-induced angina were investigated in 10 patients. The mean carboxyhemoglobin level after smoking eight nonnicotine cigarettes, one every 30 minutes, rose from 1.58 to 7.79 percent. Smoking significantly decreased the mean exercise time from the onset of exercise until the onset of angina from 109.8 to 83.5 seconds. There was significantly less of an increase in systolic blood pressure, heart rate, and product of systolic blood pressure times heart rate after exercise-induced angina after smoking compared to the nonsmoking state. Smoking nonnicotine cigarettes increased the carboxyhemoglobin level, decreasing the rate of oxygen deliverability to the myocardium, with angina developing sooner, following less cardiac work. (Auth. Abs.)

71-1032. Biener, K. **Zuckerverbrauch, Zigarettenrauchen und Herzinfarkt. [Sugar Consumption, Cigarette Smoking, and Myocardial Infarct.]** *Schweizerische Medizinische Wochenschrift* 101(39):1420-1421, October 2, 1971, German.

The results of several studies on the relationships between sugar consumption, cigarette smoking, and myocardial infarct are briefly summarized. Three studies are cited: (1) Central Middlesex Hospital, London (299 patients without diabetes or ischemic heart disease); (2) U.K. Atomic Energy Authority (2483 white collar workers born between 1912 and 1926); and (3) a North Lambeth study (2996 men born between 1903 and 1942 with duodenal ulcer). These three studies showed that sugar consumption was lowest in nonsmokers, highest in heavy smokers, and intermediate in ex-smokers. Studies by Paul et al. and by Burns-Cox, Doll, and Ball showed a relationship of myocardial infarct, not with sugar consumption, but with cigarette smoking. A Cardiff-South Wales study (2697 adult females) and another on 334 old men are then cited. In the male study, no relationship was found between ischemic heart disease and high sugar consumption. In the female study, a slight but not statistically-significant relationship was observed between angina attacks and sugar consumption. In both studies, however, there was a positive statistically-significant relationship between sugar consumption and tobacco consumption.

71-1033. Casciu, G., Marraccini, L., Zedda, S., Carta, G., Fulghesu, G. **On the Incidence of Cardiovascular Disease Among the Workers of the Mining Industry of Sardinia. 2nd Communication: Incidence in Relation to Habitual Smoking and Consumption of Alcohol.** Complete English translation of "Sulla Frequenza Delle Cardiovasculopatie tra gli Operai Dell'Industria Estrattiva Della Sardegna. Nota II: Incidenza in Rapporto all'Abitudine al Fumo e all'Alcool," *Rassegna Medica Sarda* 71(Suppl.1): 191-199, 1968.

See **Abstract 70-0144.**

71-1034. Cassel, J., Heyden, S., Bartel, A. G., Kaplan, B. H., Tyroler, H. A., Cornoni, J. C., Hames, C. G. **Occupation and Physical Activity and Coronary Heart Disease.** *Archives of Internal Medicine* 128(6):920-928, December 1971.

In a seven-year followup study of a total county population, the incidence of coronary heart disease (CHD) was found to be lower in black than in white men in every occupational category except sharecroppers. Among nonfarming occupations the occupational gradient in CHD observed in the 1960 prevalence study was no longer present when incident cases were the basis for comparison. The lower prevalence rate in white farmers compared to nonfarmers however, was confirmed in the incidence study. While smoking increased the risk of CHD in both farmers and nonfarmers, farmers had lower rates than nonfarmers whether they smoked or not. Sustained physical activity above a certain critical threshold value apparently protects against CHD. This explanation is supported by the relationship discovered between leisure time and on-the-job physical activity and the prevalence of CHD. Hypotheses concerning the possible pathogenic processes through which physical activity might operate are reviewed.

71-1035. Cassel, J. C. **Review of 1960 Through 1962 Cardiovascular Disease Prevalence Study.** *Archives of Internal Medicine* 128(6):890-895, December 1971.

The Evans County Cardiovascular Epidemiological Study was initiated to confirm the clinical observation that coronary heart disease (CHD) occurs less frequently among blacks than whites. An attempt was made to explain this difference on the basis of variations in blood pressure, serum cholesterol levels, cigarette smoking patterns diet, and occupation and physical activity. The findings showed that differences in CHD rates between the different ethnic and social class groups could not be accounted for by differences in blood pressure, cholesterol, cigarette smoking patterns, and diet. Differences in habitual physical activity was the most likely explanation for the differences in CHD prevalence.

71-1036. Cloarec, M. **Stress, Tabac et Maladie Arterielle. [Stress, Tobacco, and Arterial Disease.]** *Entretiens de Bichat. Medecine et Biologie* 1971, pp. 635-638, French.

A propective study of 870 heavy smokers is briefly described in a discussion of the relative role played by tobaccoism among other risk factors in arterial disease etiology. Arterial hypertension, obesity, hypercholesterolemia, hypertriglyceridemia, lack of physical activity, and social and family stress were among the various factors studied. The excessive use of cigarettes was found to be a definite risk factor, primarily in peripheral arterial diseases, and in coronary heart disease in general, heavy smokers having a four-fold greater incidence than nonsmokers. It was also noted that it was not the intensity of stress which characterises the heavy smoker but rather, his personal reaction to the 'aggressions' of daily living.

71-1037. Colt, J. D. **A Reproducible Treadmill Test for Intermittent Claudication.** *Angiology* 22(7):375-379, July-August 1971.

A treadmill walking test is described which can be used to make gross quantitative measurements of intermittent claudication. The test is reproducible with a minimum of variables in the individual patient. Safety during the testing appears adequate since several hundred patients have been tested without mishap, more than half of whom had documented past coronary occlusions. Pretesting internal medicine evaluations must be obtained, however. Smoking reduces the ability of the walker if he is a moderately severe claudicator, as does increased weight. Although the test is not designed to replace palpation of the pulses, plethysmography, or arteriography, it is a reproducible means of documenting the ability of the claudicator to walk.

71-1038. Dalderup, L. M. **Risk Factors for Coronary Heart Disease (CHD).** *Voeding* 32(8):406-408, August 15, 1971.

Metabolic changes playing a role in the incidence of cardiovascular disease are listed and the important effects of physical activity, smoking and diet are indicated. The problem remains extremely complicated, but examining people for metabolic abnormalities and treating them (more physical activity, less smoking, suitable dietary prescriptions, drugs) could at least make a start for a real prevention of cardiovascular disease.

71-1039. De Soldati, L., Barbiero, O., Chutlian, A., Rosental, R., Mattiauda, J. **Segundo Infarto. [Second Infarct.]** *Revista Argentina de Cardiologia* 39(3):137,138,140,142,145,146, May-June 1971, Spanish.

A study of 41 cases of second myocardial infarct showed that most infarcts occurred in males (81.8 percent) and in the age range of 50 to 60 years. Of these patients, 72.9 percent were smokers, 50 percent were diabetics, 36.5 percent were hypertensive, 45.9 percent were overweight and 48.6 percent had hypercholesteremia. An examination of combinations of predisposing factors showed that of 20 diabetic patients, 10 had hypertension, 13 were smokers and 9 were overweight; of 15 hypertensive patients, 10 were diabetic and 9 were smokers. There was no statistically significant correlation between time of appearance of the second infarct and either diabetes or hypertension. There was an increase in the incidence of heart failure as a cause of death in the second infarct. Of the 12 patients who died, 5 were diabetic and 6 were hypertensive.

71-1040. Fejfar, Z., Pisa, Z. **Ischaemic Heart Disease. Prognosis, Treatment, Rehabilitation, and Prevention.** *Cor et Vasa* 13(1):1-17, 1971.

Present knowledge about the prognosis treatment, and prevention of ischemic heart disease (IHD) is summarized and some methods which would lead to an effective mass control of the disease are outlined. In an appraisal of some risk factors associated with IHD, the importance of cigarette smoking as an aggravating factor as proved by a number of studies is discussed. After discontinuation of cigarette smoking the risk of development of IHD diminishes. In smoking there is an increased secretion of catecholamines with release of fatty acids, increased blood coagulability, carbon monoxide effects, increased peripheral vascular resistance, and other, still unknown mechanisms. The noxious effects of cigarette smoking could be reduced by manufacturing detoxicated "harmless" cigarettes and by appropriate education, which would gradually alter the social attitude towards smoking in general and the craving for cigarette smoking, particularly in adolescents. The former way would seem to be easier and faster, although the results of a systematic drive against smoking in the USA are encouraging. Administrative measures, such as higher insurance premiums to be paid by smokers in contrast to nonsmokers, still have only a limited importance.

71-1041. Gokina, M. S. **O Sokratitel'noy Sposobnosti Miokarda u Rabochikh, Podvergayushchikhsya Dlitel'nomu Vozdeystiyu Malykh Kontsentratsiy Okisi Ugleroda. [Myocardial Contractile Function in Workers Exposed to Prolonged Action of Small Concentrations of Carbon Monoxide.]** *Vrachebnoe Delo* 8:130-139, August 1971, Russian.

Observations of 76 workers (48 machinists, 28 mechanics, 20-45 years old) of a plant for the manufacture of alcohol and ammonia compresses are reported. Polycardiographic analysis of the left ventricle systolic phases using the nitroglycerine test helped to reveal latent changes of the contractile myocardial function in the workers exposed to prolonged (1-6 years) action of small amounts of carbon monoxide concentrations (15-78 mg/m^3).

71-1042. Goldbarg, A. N., Krone, R. J., Resnekov, L. **Effects of Cigarette Smoking on Hemodynamics at Rest and During Exercise. I. Normal Subjects.** *Chest* 60(6):531-536, December 1971.

Cardiovascular responses to submaximal graded upright exercise were investigated by pulmonary and subclavian arterial catheterization in nine healthy young men before and after smoking a single cigarette. At rest, after smoking, the mean cardiac index and mean heart rate increased, while arteriovenous oxygen difference, stroke index, and mean pulmonary arterial pressure remained unchanged. During successively increasing levels of exercise, the mean heart rate was greater and the stroke index lower than values for comparable work before smoking. The arteriovenous carbon dioxide, oxygen consumption, pulmonary arterial pressure, systemic vascular resistance, lactate production, pulmonary ventilation, and arterial oxygen pressure did not change significantly. By decreasing the stroke volume response to exercise, smoking a single cigarette significantly alters the hemodynamic response to exercise in a direction opposite to physical training.

71-1043. Gordon, T., Sorlie, P., Kannel W. B. **Section 27. Coronary Heart Disease, Atherothrombotic Brain**

Infarction, Intermittent Claudication–A Multivariate Analysis of Some Factors Related to Their Incidence: Framingham Study, 16-Year Followup. In: Kannel, W. B., Gordon, T. (Editors). *The Framingham Study. An Epidemiological Investigation of Cardiovascular Disease.* U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Washington, D.C., May 1971, 42 pp.

This report has considered, both by univariate and multivariate analysis, the relation of certain key characteristics to the major atherosclerotic events–coronary heart disease (CHD), atherothrombotic brain infarction (ABI), and intermittent claudication (IC). These key characteristics–blood pressure, serum cholesterol, cigarette smoking, LVH-ECG and glucose intolerance–have been shown to be related to all three major atherosclerotic events. In general, relationships appear to be as strong for women as men. When the whole set of variables is considered jointly they have a closer association with ABI and IC than with CHD. In men two of these variables–serum cholesterol and cigarette smoking–seem to bear their strongest relation to CHD at young ages, the relationship seeming to essentially disappear by the age group 65-74 years. Other age differentials are less clear, and taken as a whole, this set of variables is associated with each atherosclerotic event equally strongly in all age groups between 45 and 74 years. These three atherosclerotic events are related not only in terms of common precursive factors but also in that both CHD and IC seem to independently predispose to other atherosclerotic events. CHD, ABI and IC are distinguished by different levels of incidence by age and sex and also in terms of the relative importance of the key factors. The dominant factor predisposing to ABI is high blood pressure. None of the key factors is clearly dominant for CHD but glucose intolerance is only weakly related to this atherosclerotic disease and cigarette smoking has little relationship to CHD in the form of uncomplicated angina pectoris. All five factors play an important role in intermittent claudication, with glucose intolerance more important for this event than for either CHD or ABI. (Auth. Abs. Mod.)

71-1044. Heyden, S., Cassel, J. C., Bartel, A., Tyroler, H. A., Hames, C. G., Cornoni, J. C. **Body Weight and Cigarette Smoking as Risk Factors.** *Archives of Internal Medicine* 128(6):915-919, December 1971.

In males, the incidence rate of coronary heart disease (CHD) in white noncigarette smokers was 52.7/1,000 and among blacks, 9.8/1,000; among white cigarette smokers the rate was 101/1,000 but in blacks only 32.5/1,000. The incidence rate of CHD in the leanest whites was 95.5/1,000, among the leanest blacks, 24.1/1,000; however, in the most obese whites the rate was 137/1,000 and among the blacks, 53.6/1,000. When comparing white smokers with nonsmokers in the leanest and most obese tertiles, smokers run a substantial risk of developing CHD, increasing with increase in overweight (80, 90, and 150/1,000, respectively). The risk of nonsmokers developing CHD does not increase from the leanest to the moderately overweight and the most obsese group, (51, 30, and 64/1,000, respectively). Therefore, obesity in white males seems to enhance the risk of CHD among cigarette smokers but not among nonsmokers. (Auth. Abs.)

71-1045. Hinkle, L. E. (Jr.) **The Antecedents of Myocardial Infarction and Sudden Death in a Cohort of Actively Employed Men.** *Journal of Occupational Medicine* 13(9):433-440, September 1971.

The incidence of coronary heart disease and sudden death in actively employed middle-aged American men and some of the characteristics of these men who die suddenly and unexpectedly were investigated. The study was based on a prospective and retrospective investigation of a random sample of 301 men of median age 55 who were on the active payroll of the New Jersey Bell Telephone Company in 1962. The findings showed that middle-aged men whose deaths are due to coronary heart disease are not drawn from the population of apparently healthy men. Coronary deaths occur among a mixed population of men with what appears, on clinical examination, to be coronary heart disease, hypertensive cardiovascular disease and chronic lung disease, or some combination of these conditions. Most men who die coronary deaths also have one or more significant metabolic abnormalities such as hyperlipidemia, impaired glucose tolerance, elevated serum uric acid, obesity and alcoholism. Of 24 men who died from coronary heart disease, 19 had smoked for more than 30 years, and 7 were still smoking two packs of cigarettes per day when they were examined. Many of the physiological abnormalities and pathological conditions of men who die coronary deaths could have been detected within two to three years prior to death. Men dying from coronary heart disease, including those who die suddenly and unexpectedly, have abnormalities of cardiac rate, rhythm and conduction prior to the onset of their fatal episode.

71-1046. Hloucal, L., Dusek, J. **Aetiopathogenese und Prophylaxe der koronaren Atherosklerose (II). [Etiopathogenesis and Prophylaxis of Coronary Atherosclerosis (II).]** *Zeitschrift fur Therapie* 9(5):257-267, 1971. German.

The etiopathogenesis of atherosclerosis and its clinical manifestations, especially coronary heart disease, is complicated and has not been solved thus far. In addition to endogenous factors (genetic influences inherited metabolic disturbances, enzymatic defects of the vascular wall, and improper hormonal regulation), a series of so-called risk factors contribute to the origin, development, and manifestation of atherosclerosis which has been demonstrated in many epidemiological studies. Included in these are the living habits of the civilized world: influences of nutrition, sedentary occupation, and lack of physical activity connected with the development of automation and automobile travel, in addition to overweight hypertension, disturbances of glucose metabolism, excessive smoking, and especially influence of stress. Hyperlipemia, particularly hypercholesteremia, hypertriglyceridemia, and elevated values of beta-lipoproteins are important indications for the origin and development of atherosclerosis. Smoking is not a primary atherogenic factor but appears to promote thrombogenesis. Chain smoking is considered to be a result of greater nervous stress. The incidence of coronary atherosclerosis is lowest in nonsmokers engaged in physical labor. Primary prophylaxis by diet and exercise regimens should be instituted in potential and latent atherosclerotics even at a young age. A secondary prophylaxis in manifest atherosclerosis with hyperlipemia is accomplished by drugs with hypolipemic effect. Both physical and psychic rehabilitation should be carried out after acute myocardial infarct.

71-1047. Isager, H., Hagerup, L. **Relationship Between Cigarette Smoking and High Packed Cell Volume and Haemoglobin Levels.** *Scandinavian Journal of Haematology* 8(4):241-244, 1971.

In a study including 394 men and 339 women, all aged fifty, a positive correlation between cigarette consumption and packed cell volume (PCV) was found in both sexes. In women, a statistically significant correlation was also found between cigarette consumption and hemoglobin concentration. In male cigarette smokers, the incidences of PCV-values over normal range and of subnormal mean corpuscular hemoglobin concentration-values were significantly higher than in males who did not smoke cigarettes (smokers and nonsmokers). A statistically significant negative correlation was found between cigarette consumption and lung function (forced expiratory volume in one second) but there was no evidence of any relationship between lung function and hematological variables. From these results it is concluded that the association between cigarette smoking and hematological variables is probably not secondary to the relationship between cigarette consumption and lung function. (Auth. Abs. Mod.)

71-1048. Jahnecke, J. **Prophylaxe von Herz- und Gefassschaden durch Ausschaltung von Risikofaktoren in der arztlichen Praxis. [Prophylaxis of Cardiovascular Diseases by Elimination of Risk Factors in Medical Practice.]** *Zeitschrift fur Allgemeinmedizin der Landarzt* 47(24):1189-1199, August 31, 1971, German.

The present work undertakes the study of cardiovascular diseases in the light of current considerations of diagnosis and therapy. Hypertension appears to be the most important single risk factor, not only for arteriosclerotic diseases of the heart, but also for peripheral and cerebrovascular arterial diseases. Diabetes mellitus is deserving of equal rank with hypertension. The other risk factors discussed are cigarette smoking, overweight, hyperlipidemia, and heredity. Elimination of risk factors results in an impressive and statistically-significant improvement in prognosis. Mortality figures indicate the need to institute prophylactic measures before the age of 40 years. Prophylaxis initiated after 50 years of age appears to be less successful. Most risk factors can be completely eliminated by a purposeful "concentrated" treatment.

71-1049. Mathes, P., Rival, J. **The Effect of Nicotine on Regional Blood Flow in the Canine Heart.** *Proceedings of the Society for Experimental Biology and Medicine* 138(1):361-364, October 1971.

The effect of nicotine administration on regional myocardial blood flow was examined in normal hearts and after partial coronary artery occlusion. Under normal circumstances as well as after infusion of nicotine in normal hearts, the subendocardial protion of the myocardium had a higher capillary flow than the subepicardial fraction. Partial coronary artery constriction alone did not alter this relationship; however, when it was followed by infusion of nicotine, a significant reduction in capillary flow in the inner portion of the myocardium compared to the outer part was observed. (Auth. Abs.)

71-1050. Modan, B. **'Epidemiyologya shel Mahalot Lev Tarashtiyot. [Epidemiology of Sclerotic Heart Diseases.]** *Harefuah* 59(10):431-440, November 15, 1970, Hebrew.

A number of factors which have been clearly established as causes of heart disease, such as hypercholesteremia, hypertension, stress, and cigarette smoking, are reviewed. The report also deals with other factors having some influence on the disease such as race, age, marital status, occupation, physical activity, socioeconomic level, climate, and drinking. Smokers are three times as likely to develop ischemic heart disease as nonsmokers. Cholesterol levels among young smokers are higher than among nonsmokers. Chronic carbon monoxide poisoning caused by smoking can also have a damaging effect on the heart. Theories as to the manner in which smoking effects the body vary. Smoking may accelerate the atherosclerotic process, it may act directly on blood vessels, or it may accelerate blood clotting and the destructive disturbances in rhythm. The prevention of heart disease is also discussed.

71-1051. Naeye, R. L., Dellinger, W. S. **Pulmonary Arterial Changes With Age and Smoking.** *Archives of Pathology* 92(4):284-288, October 1971.

A quantitative, histologic analysis was undertaken on small pulmonary arteries of 126 long-term male cigarette smokers and 67 nonsmokers. The percent of small pulmonary artery walls comprised of normal circular smooth muscle decreased with age more rapidly in smokers than in nonsmokers. The younger nonsmokers had less arterial longitudinal muscle than did similar aged smokers. Between ages 30 and 70, collagen content of arterial walls increased from 8 percent to 25 percent in nonsmokers and from 15 percent to 39 percent in smokers. The vascular abnormalities may have little functional importance because there was no significant increase in cor pulmonale as the abnormal constituents increased in the arterial walls. Smokers had thicker right cardiac ventricles than did nonsmokers, presumably due to increased vascular resistance at some site other than the small pulmonary arteries. (Auth. Abs.)

71-1052. Pasquazzi, M. **I Fattori di Rischio Coronarico. [Coronary Risk Factors.]** *Policlinico; Sezione Pratica* 78(14):575-587, July 15, 1971, Italian.

The present status of risk factors for coronary heart disease is reviewed. Although there is no doubt concerning the statistical association of many factors with an increased risk of coronary heart disease no causal relationships have been established. The major risk factors (hypercholesteremia, hypertension, obesity diabetes, sedentary living, and cigarette smoking) are examined. As the different studies show, the risk of coronary disease increases with the number of cigarettes smoked, with the duration of the smoking habit and with the depth of inhalation. Pipe and cigar smoking does not appear to increase coronary risk and a lower incidence of coronary disease has been observed in ex-smokers.

71-1053. Paul, O. **Myocardial Infarction and Sudden Death.** *Hospital Practice* 6(11):91-103, November 1971.

Studies have shown that most sudden cardiovascular deaths, particularly those caused by coronary disease, occur in the first hours of the 24-hour period following onset of acute signs and symptoms, and that the bulk of victims die at home or en route to the hospital. However, death rates have been reduced by as much as 50 percent in patients receiving optimal care in coronary care units. Thrombosis appears to be involved in only a minority of cases, but other pathophysiologic factors such as abnormal free fatty acid metabolism, arrhythmias, and microcirculatory compromise may be implicated. There is little evidence that physical or emotional stress is likely to trigger most sudden deaths. Risk factors associated with arteriosclerotic heart disease, notably hypercholesterolemia, hypertension, hyperglycemia, and excessive cigarette smoking, also heighten the risk of both fatal and nonfatal infarction. However, factors related to sudden death may not carry the same weight in reference to nonfatal infarction. Cigarette smoking may be one such factor. The possibility that excessive smoking is a critical factor in precipitating sudden death is supported by the fact that survival time after onset of acute myocardial infarction decreases sharply in heavy smokers. Research emphasis is now being placed on identifying both epidemiologic and prodromal clues.

71-1054. Pincherle, G. **Factors Affecting the Mean Serum Cholesterol.** *Journal of Chronic Diseases* 24(5):289-297, August 1971.

Cholesterol examinations were conducted on over 7000 businessmen between 1964 and 1969. Mean cholesterol levels were related to age, sex, height, obesity, blood pressure, calcification in the iliac arteries, exercise, mental stress, uric acid levels and season of the year. There was an increase in mean cholesterol with increasing numbers of cigarettes smoked. However, ex-smokers showed no decrease in cholesterol levels. No correlation was found with enlargement of the heart and the presence of cardiographic abnormalities. The significance of these findings to the individual patient and the epidemiology of ischemic heart disease is discussed.

71-1055. Preuss, E.-G., Eder, H., Weller, P. **Risk Factors in Occlusive Diseases of the Peripheral Arteries of Varying Severity.** Complete English translation of "Risikofaktoren bei peripheren arteriellen Verschlusskrankheiten unterschiedlichen Schweregrades," *Zeitschrift fur die Gesamte Innere Medizin und Ihre Grenzgebiete* 25(10):464-468, May 15, 1970.

See **Abstract 70-0906.**

71-1056. Rosenman, R. H., Friedman, M. **The Central Nervous System and Coronary Heart Disease.** *Hospital Practice* 6(10):87-97, October 1971.

A prospective study among more than 3000 men has demonstrated that aggressive behavior plays a major pathogenetic role in coronary disease. The study describes a behavior pattern Type A individual who comprises rather specific personality traits including ambition, competitive drive, aggressiveness, impatience, and a strong sense of time urgency. After 8½ years of follow-up studies, the incidence of new coronary disease events in the study population was found to run at least twice as high among Type A as among Type B subjects (described as extremely passive and lacking drive). Moreover, in the presence of Type A behavior, the risk of recurrence of myocardial infarction is markedly increased; in addition, there is a definite trend to Type A behavior in cases of myocardial infarction that terminated in death. With statistical control of a broad series of other coronary risk factors by means of a multiple regression procedure, the predictive power of Type A behavior persisted especially among younger men in the study group Among men in the 39–49-year age group at entry, the coronary disease risk was at least twice that among Type B men of the same age. Older men manifesting Type A behavior were also at increased risk although the difference here was less significant. The 12 risk factors held constant in this analysis (made after 4½ years of follow-up) included (among others) hypercholesterolemia, hypertension, excessive cigarette smoking, obesity, and parental history of coronary disease. The hypothalamus may be the CNS region involved in hypercholesterolemia seen in Type A individuals. Experiments in rats suggest that the specific areas involved are fornix, medial portion of lateral hypothalamic areas, and the ventromedial nucleus.

71-1057. Schmauss, A. K., Arlt, E. **Morphological Findings, Postoperative Complications, Mortality and Duration of Bed Rest Following Amputations Occasioned by Disorders of the Peripheral Circulation.** Complete English translation of "Morphologische Befunde, postoperative Komplikationen, Letalitat und Liegedauer nach Amputation wegen Durchblutungsstorungen," *Zeitschrift fur Arztliche Fortbildung* 64(2):84-87, January 15, 1970.

See **Abstract 70-0470.**

71-1058. Siedek, H. **Die Prophylaxe der arteriosklerotischen Herz- und Gefasserkrankungen. [The Prophylaxis of Arteriosclerotic Cardiovascular Diseases.]** *Wiener Medizinische Wochenschrift* 121(30/31/32):575-581, July 31, 1971, German.

The major experimental and clinical studies that have revealed the significance of various risk factors for arteriosclerotic diseases are reviewed. The present report deals with the roles of generally-acknowledged risk factors such as hyperlipidemia, hypertension, the diabetic metabolic state, obesity, physical inactivity, body constitution and familial influence, and smoking. Heavy cigarette smoking has been implicated in almost all epidemiological studies in the development of myocardial infarct, peripheral vascular occlusive diseases and cerebral infarct. There is no connection between smoking and hypercholesteremia and hypertriglyceridemia but nicotine has a mobilizing influence on catecholamines and increases the percentage of nonesterified fatty acids which in turn influence thrombocyte adhesiveness. The value of several drugs in current use in the prophylaxis of arteriosclerotic cardiovascular diseases are also discussed.

71-1059. Stamler, J., Stamler, R., Shekelle, R. B. **Regional Differences in Prevalence, Incidence and Mortality From Atherosclerotic Coronary Heart Disease.** In: deHass, J. H., Hemker, H. C., Snellen, H. A. (Editors). *Ischaemic Heart Disease.* Leiden, The Netherlands, Leiden University Press, 1970, pp. 84-127.

The major methods of comparing impact of coronary heart disease on different populations yield similar findings. Regional differences are marked, whether the data examined are from international pathological studies, comparison of mortality rates or studies of living populations. In the more economically developed countries, premature coronary heart disease (CHD) is already a major epidemic. Time trend studies indicate both an increase in CHD in these countries and beginning of change in less developed countries that are on the road to greater economic development. Racial, ethnic, geographic or climatic factors as possible causes can be eliminated by data coming from time trend studies, migration statistics on prevalence and mortality, as well as study of class differences in CHD rates within single countries. The high order correlation between CHD mortality and national income provides an important etiologic clue. While higher income itself cannot explain the higher mortality, it is, at least until now, accompanied by a mode of life whose characteristics can be etiologically connected to excess CHD mortality. These characteristics include a nutrition pattern high in total calories, total fat, saturated fat and dietary cholesterol; heavy cigarette smoking and sedentary living habits. The international comparative data pinpoint intake of saturated fat as the major dietary factor accounting for differences in CHD mortality among the 22 countries surveyed. Although other nutrients are often associated with high saturated fat intake (protein, sucrose) the data do not justify attributing an independent causal role to them. When such factors as atherogenic dietary patterns, cigarette smoking and sedentary living habits are present together, CHD mortality rates are increased even further. Knowledge shed by such international comparisons dealing with the etiology of coronary heart disease could help lower the coronary and overall mortality to the lower level still prevalent in the less developed countries.

71-1060. Storch, H., Engelmann, L., Kohler, H. **Der Herzinfarkt im Jungeren Lebensalter. [Myocardial Infarct in Young People]** *Deutsche Gesundheitswesen* 26(34):1593-1600, August 1971, German.

Thirty patients, only three of whom were women, who had suffered myocardial infarct prior to the age of 40 years, are studied. These cases comprise only 2.07 percent of the 1147 persons investigated. The absolute increase in the total rate of infarct in the younger and medium ages is demonstrated. Risk factors could be detected in 25 of 27 evaluative cases. Smoking is found to play a dominant role in myocardial infarct in younger patients. Of 22 patients with valid smoking data, 16 smoked from 16 to 30 cigarettes daily. Chest pain complaints are detectable as a main complaint only in about 50 percent of the cases. Silent infarct is not detectable in these cases. As with older infarct patients, strong psychic or physical stress are of great importance as releasing factors. Anterior wall and combined infarcts prevail. In the acute syndrome, transaminases, acceleration of blood precipitation, leukocytosis, and a fever reaction at high percentages are detectable. Almost invariably a coronary sclerosis, with or without thrombosis, is found on autopsy. The prognosis is more favorable than in infarct patients in more advanced age. (Auth. Abs. Mod.)

71-1061. Summers, D. N., Richmond, S., Wechsler, B. M. **Cigarette Smoke: Effects on Lactate Extraction in the Presence of Severe Coronary Atherosclerosis.** *American Heart Journal* 82(4):458-467, October 1971.

Fifteen patients with angiographically demonstrated severe obstructive coronary artery disease were the study subjects. Hemodynamic measurements were made before and during cigarette smoking, and metabolic evaluation was performed in these states and during isoproterenol stress. Heart rate, aortic pressure systolic ejection and diastolic filling periods were measured. Myocardial lactate extraction was evaluated at three coronary sinus drainage sites. Despite increases in heart rate, aortic pressure the systolic ejection period per minute and the tension-time index per minute lactate production was not induced by smoking in any patient without lactate production in the control state. In three patients with lactate abnormalites prior to smoking, inhalation of cigarette smoke sustained and slightly aggravated this circumstance. Isoproterenol induced lactate production in all but one patient. Cigarette smoking in a group of patients with severe obstructive coronary artery disease did not produce evidence of ischemia as determined by abnormalities in lactate extraction. (Auth. Abs.)

71-1062. Wilbert, L. **Nikotinkonsum und arterielle Verschlusskrankheit. [Nicotine Consumption and Arterial Occlusive Disease.]** *Medizinische Klinik* 66(36):1190-1192, September 3, 1971, German.

A group of 190 nondiabetic patients with peripheral vascular disease consisted of 181 smokers (95.3 percent; 171 men, 10 women) and 9 nonsmokers (4.7 percent; 3 men, 6 women). Most smokers consumed more than 10 cigarettes daily with consumption in the 40 to 70-year-olds of 18 to 20 cigarettes daily. Four nonsmokers were hypertensive. Vascular disease was found in six women and two men (4.2 percent). Arterial occlusions were found in 64.7 percent in the femoropopliteal region, in 22.8 percent in the aortoiliac region and in 12.5 percent below knee joints. There was no relation between the number of cigarettes smoked and the location of the occlusive process. The findings show a considerable increase of obliterative arterial disease after the age of 50 years. (Auth. Abs. Mod.)

See also **71-0972, 71-0975, 71-0995, 71-1025, 71-1071**

OTHER DISEASES AND CONDITIONS

71-1063. Ainamo, J. **The Seeming Effect of Tobacco Consumption on the Occurrence of Periodontal Disease and Dental Caries.** *Suomen Hammaslaakariseuran Toimituksia* 67:87-94, 1971.

In young adult males there seems to be an inverse correlation between the frequencies of tobacco consumption and toothbrushing. The corresponding higher Plaque Index scores in smokers than in nonsmokers were suggested to have resulted in the higher amounts of dental calculus and open caries lesions, respectively. The trend towards more advanced marginal bone loss with increased smoking was a result of the abundance of plaque retentive calculus and caries. The higher Plaque Index scores were not accompanied by higher Gingival Index scores in smokers than in nonsmokers. This finding was suggested to derive either from an increase of gingival resistance or from a decrease of the virulence of the plaque as a result from the heat and toxic irritants involved in the tobacco fumes. The study failed to confirm the earlier presumption that tobacco consumption per se would advance the development of periodontal disease and dental caries. It seems more probable that smoking and poor oral hygiene are concomitant characteristics of the same individual and that those who smoke are negligent not only of their health in general but also of their oral hygiene and dental conditions. (Auth. Abs. Mod.)

71-1064. Bernhard, P. **Certain Injurious Effects of Cigarette Smoking on Women.** Complete English translation of "Sichere Schaden des Zigarettenrauchens bei der Frau," *Medizinische Monatsschrift* 3:58-50, 1949.

On the basis of investigations extending over the past 20 years involving 458 female smokers and 5000 female nonsmokers, the following injurious effects of cigarette smoking on women were found. The thyroid undergoes changes leading to hypothyreosis or hyperthyreosis. By the way of the thyroid glands, other endocrine glands are affected, particularly the ovaries. Smoking may cause disturbances of growth and of puberty in young girls. In a number of ,female smokers, menstrual cycle disorders occur by way of neurohormonal actions. In a great number of women, cigarette smoking causes contractions of the smooth-muscled organs of the genitalia referred to as "genital sensations" and "tubal cramps". Smoking may be the cause of sterility in women. Having effects going beyond a dysfunction of the endocrine glands, smoking may cause a hormonal, especially thyreogenic, sterility by stimulating and paralyzing the smooth muscles of the genitalia. Also, a decrease of the libido due to the consumption of nicotine reduces the possibilities of conception. In some female smokers, the climacterium occurs prematurely. Women smokers also age prematurely. The decrease of the libido and the appearance of certain virile traits are found more frequently in smokers than in nonsmokers. In predisposed cases, cigarette smoking may induce the complex of eclamptic symptoms. Cigarette smoking has been statistically confirmed to cause, in a number of pregnant women, miscarriages as well as premature birth.

71-1065. Daniell, H. W. **Smoker's Wrinkles. A Study in the Epidemiology of "Crow's Feet."** *Annals of Internal Medicine* 75(6):873-880, December 1971.

A simple method of grading the severity of facial skin wrinkling is described. It can be rapidly learned and easily used by untrained students. In a study of 1,104 subjects the severity of wrinkling correlated with a history of habitual cigarette smoking, after adjustment for age and outdoor exposure. The association between cigarette smoking and wrinkling was striking in both sexes soon after age 30, was related to the duration and intensity of cigarette smoking, and was more pronounced than was the association between wrinkling and admitted outdoor exposure. Smokers in the 40- to 49-year age group were as likely to be prominently wrinkled as nonsmokers who were 20 years older. (Auth. Abs.)

71-1066. Dickens, G., Trethowan, W. H. **Cravings and Aversions During Pregnancy.** *Journal of Psychosomatic Research* 15:259-268, September 1971.

The prevalence and nature of cravings and aversions for certain foods not normally compulsively longed for or disliked were studied in 100 primiparae. Either or both were found to occur frequently, and more often together than separately. The most common craving was for fruit and sweet, sour, or sharp-tasting foodstuffs. The most common aversion was for tea or coffee. The cravings are more probably the result of an impaired sense of taste in pregnancy whereas aversions may have more to do with an alteration in the sense of smell. Cravings and aversions occurred significantly more often in women with a history of pica in childhood, in women with a history of appetite change in response to emotional stress, and in women who smoked or drank alcohol before pregnancy. During pregnancy, there was a sharp drop in the number of women who smoked, and this amounted to 15 percent in those with aversions and cravings. The presence of cravings and aversions may indicate a predisposition due to a degree of oral fixation.

71-1067. Doyle, M. J., Lopez-Amor, E., Dingman, J. F. **Hypersecretion of Arginine Vasopressin in Acromegaly.** *Journal of Clinical Endocrinology and Metabolism* 33(3):418-423, September 1971.

Four of five patients with untreated active acromegaly demonstrated prolonged antidiuresis and sustained release of arginine vasopressin (AVP) with nicotine stimulation of the neurohypophysis. This hyperresponsiveness was acutely suppressed by adrenal steroids in two subjects. Long-term estrogen treatment restored a normal nicotine response in one patient; another showed improved nicotine response after pituitary X-ray irradiation and a normal response with added estrogen therapy. Three additional active patients in clinical remission with estrogen medication showed normal responses to nicotine. These studies suggest that, in active acromegaly there is a neurohypophyseal hyperresponsiveness to nicotine which improves with clinical remission of the disease. Since the osmoregulatory responses of the neurohypophysis to dehydration, hemodilution and induced hyperosmolality fell within the expected normal range, it appears to be a selective neurohypophyseal derangement. (Auth. Abs.)

71-1068. Fedrick, J., Butler, N. R. **Certain Causes of Neonatal Death. IV. Massive Pulmonary Haemorrhage.** *Biology of the Neonate* 18(3/4):243-262, 1971.

A total of 122 singleton deaths with massive pulmonary hemorrhage collected in the 1958 British Perinatal Mortality Survey was compared with a control population of 16,625 live births. A high incidence among multiple births was noted, as well as a high proportion of infants with congenital heart disease. Excluding these, it was noted that the majority of infants died on the third and fourth days. Forty percent had been asphyxiated at birth and in most cases the symptoms, which were frequently cerebral, did not appear until after the first day. There was a high incidence among immature infants, but the majority of cases were delivered at term. There was marked growth retardation in many of these. Altogether there were almost three times as many males as females. Although long membrane rupture, a history of antepartum hemorrhage and low social class were of some importance in the etiology of the lesion, the main factors were primiparity, maternal smoking in pregnancy, poor past obstetric history, transferral of the infant after delivery, and severe maternal pre-eclampsia, especially if the delivery was abdominal. (Auth. Abs. Mod.)

71-1069. Guerre, J., Ayache, R., Matuchanski, J., Jannon, P., Pequignot, H. **Les Sequelles Tardives des Gastrectomies. [Delayed After-Effects of Gastrectomy.]** *Entretiens de Bichat. Medecine et Biologie* 1971, pp. 71-76, French.

A study of 193 patients who had undergone gastrectomy is briefly described. Functional complicatons were reported by 60 percent of the subjects. The time lapsed since gastrectomy was performed was not related to whether or not complications appeared, since the period ranged from 3 to 45 years in the cases studied. Of several exogenous factors discussed which may aggravate the complications, smoking is noted to be of primary importance. It appears that smoking is less tolerated by these who have undergone gastrectomy because it produces severe after-effects locally from smoke irritation. Of the patients who complained of after-effects, 55 percent were smokers.

71-1070. McKendrick, A.J.W., Barbenel, L.M.H., McHugh, W.D. **The Influence of Time of Examination, Eating, Smoking and Frequency of Brushing on the Oral Debris Index.** *Journal of Peridontal Research* 5:205-207, 1970.

The effects of time of day, eating since the teeth were last brushed, and the number of stained teeth in smokers, on the oral debris index of 103 subjects were examined. None of these effects was found to be significant. Increased frequency of toothbrushing produced a statistically significant reduction in oral debris. (Auth. Abs. Mod.)

71-1071. Medical Letter on Drugs and Therapeutics. **Cigarette Smoking and Carbon Monoxide.** *Medical Letter on Drugs and Therapeutics* 13(22):91-92, October 29, 1971.

Evidence is reviewed which suggests that carbon monoxide in cigarette smoke may be injurous to persons with coronary, cerebral or peripheral vascular insufficiency, and that it may have adverse effects on the sensory and motor faculties required for the safe handling of a car or airplane.

71-1072. Shea, J. J., Kitabchi, A. E. **Management of Fluctuant Hearing Loss.** *Journal of the Tennessee Medical Association* 64(10):862-869, October 1971.

Fluctuant hearing loss is an inner ear disorder characterized by fullness, tinnitus, fluctuation in hearing, and vertigo. Obstruction of the endolymphatic duct and sac are known to be associated with Meniere's disease but various metabolic disorders are also associated with fluctuant hearing loss. Most important of these is an abnormal glucose tolerance, which was found in 57 percent of cases, in 50 percent of which the glucose intolerance had not been previously observed. Also detected were hyperlipemia in 7 percent, excessive smoking in 10 percent, fluid retention in 10 percent, allergy in 7 percent, and anxiety in 7 percent. The diagnosis and treatment of this disorder are discussed.

71-1073. Talamo, R. C. **The Alpha$_1$-Antitrypsin in Man.** *Journal of Allergy and Clinical Immunology* 48(4):240-250, October 1971.

Recent studies related to alpha$_1$-antitrypsin are reviewed emphasizing its important role in human physiology. Various methods for the evaluation of serum alpha$_1$-antitrypsin and the related genetic typing of individuals are described. Its relationship to familial emphysema, other pulmonary diseases, and familial cirrhosis are discussed particularly as related to tissue damage. Although the exact normal role of the alpha$_1$-antitrypsin is not known, research findings suggest that it plays a central role in the maintenance of normal tissue integrity. The severe inherited deficiency of a normal enzyme inhibitor thus can lead to pulmonary damage and other diseases.

71-1074. Tyldesley, W. R. **Tobacco Chewing in English Coal Miners. A Preliminary Report.** *British Journal of Oral Surgery* 9(1):21-28, July 1971.

The tobacco chewing habits of 1490 coal miners from 5 closely associated mines in South Lancashire, England were studied. Among the miners, 7 of 399 surface workers and 374 of 1091 underground workers were chewers; 178 of the chewers were also smokers. Of the 633 nonchewers, 243 were smokers. There were 22 chewers with leukoplakia and pre-leukoplakia, 10 of whom had lesions in multiple sites. Pre-leukoplakia was found in only one nonchewer. The incidence of leukoedema was 10 percent in chewers and 4.9 percent in nonchewers. An analysis of site distribution of the lesions showed 37.5 percent were in the alveolar ridge mucosa.

There was no evidence of incipient malignant change in any of the lesions studied. The fact that many miners had a mixed chewing-smoking habit and its possible influence on the findings are discussed.

BEHAVIORAL AND EDUCATIONAL RESEARCH

71-1075. Beal, G. M., Warren, R. D., Fleischman, W. A. **Smoking Behavior.** Department of Sociology and Anthropology, Iowa State University, Ames, Iowa, Sociology Report No. 88A, June 1971, 146 pp.

This report is a descriptive analysis of individual attitudes, beliefs, situations, and behavior related to smoking and health, based on a nonmetropolitan area sample of adults. Data on which the report is based are presented in tabular form in *Smoking Behavior. Data Book*, Sociology Report No. 88B. (*See* Abstract 71-1076.) A second set of data are contained in a report presenting a description of actual and potential resources available in health and health related organizations for the implementation of programs designed to reduce the incidence of cigarette smoking (Sociology Report No. 90). Implications from these two sets of data are presented in a third report which deals with the development of alternative types of intervention processes directed at decreasing cigarette smoking in nonmetropolitan areas (Sociology Report No. 91). (*See* Abstracts 71-1082 and 71-1083.)

71-1076. Beal, G. M., Warren, R. D., Fleischman, W. A. **Smoking Behavior. Data Book.** Department of Sociology and Anthropology, Iowa State University, Ames, Iowa, Sociology Report No. 88B, June 1971. Unpaged.

This report presents data based on a nonmetropolitan area sample of individuals and includes attitudes, beliefs, situations, and behavior related to smoking and health. A description and analysis of these findings are presented in *Smoking Behavior*, Sociology Report No. 88A. (*See* Abstract 71-1075.) The 54-page interview questionnaire used in this survey is appended to the present report.

71-1077. Eisinger, R. A. **Nicotine and Addiction to Cigarettes.** *British Journal of Addiction* 66(2):150-156, 1971.

Psychological addiction as a function of nicotine content of cigarettes smoked was examined. There appears to be some relationship, although it is not the most prominent dosage factor, between nicotine and psychological addiction to cigarettes. Investigations of physiological or pharmacological addiction to cigarettes have concentrated upon the primary importance of nicotine in the addictive process. Results of the analyses performed suggest the independence of psychological addiction to cigarettes from the unvalidated concept of physiological or pharmacological addiction. (Auth. Abs. Mod.)

71-1078. Frankenhaeuser, M. **Behavior and Circulating Catecholamines.** *Brain Research* 31:241-262, August 20, 1971.

A review is presented of the relationships between two catecholamines in blood, adrenaline and noradrenaline and behavioral functions of healthy human subjects. Experiments with catecholamine infusions are described and laboratory studies of the effects induced on catecholamine secretion by various activities and environmental influences are reported. The effects of some centrally acting drugs, such as nicotine, on catecholamine output are considered. The importance of circulating adrenaline for a variety of psychological functions has been clearly demonstrated by experimental results, while the possible significance of circulating noradrenaline in relation to behavior remains obscure. The data available today suggest that the concept of adrenaline as an 'emergency hormone', which facilitates fight and flight reactions under conditions inducing rage and fear, should be extended to include also the coping behavior of healthy individuals exposed to everyday stress situations. The mechanism by which adrenaline influences the central nervous system is not yet understood, but data from behavioral studies clearly show that adrenaline secretion is related to both cognitive and emotional functions.

71-1079. Gossett, J. T., Lewis, J. M., Phillips, V. A. **Extent and Prevalence of Illicit Drug Use as Reported by 56,745 Students.** *Journal of the American Medical Association* 216(9):1464-1470, May 31, 1971.

A survey of all junior and senior high students in the nation's tenth largest public school system (Dallas Independent School District) revealed that 28 percent reported experimentation with an illicit drug, 8 percent reported use more than ten times and 4 percent reported frequent current use. The rank order of "popularity" for 61 drugs was different for the junior- and senior-high populations. Although both groups acknowledged using alcohol most frequently, followed by tobacco, the next most frequently used drug for the senior-high student was marihuana, followed in order by nonprescription stimulants, glue, solvents, and amphetamines. Junior-high students reported glue, solvents, nonprescription stimulants, marihuana, and lighter fluid in that order following alcohol and tobacco. Boys reported more illicit drug use than girls, upper class students more than lower. Peers were most often the source. The survey appears to reflect high levels of reliability and validity for an approach of this kind. Two repetitions of the survey are planned in the 1970 to 1971 school year.

71-1080. Graham, S., Gibson, R. W. **Cessation of Patterned Behavior: Withdrawal From Smoking.** *Social Science and Medicine* 5(4):319-337, August, 1971.

The hypothesis that an innovation will be acceptable if 1) there is improvement with compatability, and 2) there is increased contact with the innovation, is tested as it applies to cessation of smoking. It was hypothesized that individuals successful in stopping smoking would be those with pre-existing needs, values, knowledge, attitudes, and behavior which would be compatible with and could find improvement in withdrawal. Their milieu would also provide contact with the idea of not smoking or abandoning the habit. A group of 996 males were interviewed and classified according to their smoking behavior as: Never Smoked; Never Stopped; Recidivists (those who had tried stopping for at least a week but had resumed); and Successes (those who had stopped at least one year prior to the survey and had never resumed). Successes and Never Smoked appeared to be more aware of the scientific evidence on the hazards of smoking than those who continued to smoke. There was evidence that they were less habituated to smoking, that they had more symptoms of respiratory pathology, and that they had had more serious illness in the past. Successes seemed to have a more highly developed rationale as to why smoking should be discontinued than Recidivists. In addition, individuals associated rather intimately with Successes, such as fathers and wives, had similar behavior, suggesting that they provided greater contact with the idea of not smoking and implying that cessation of smoking may be more easily achieved when others in the milieu also have not smoked or have given it up. The importance of the social factors in such changes may be suggested by the fact that Recividists frequently noted that the urgings of their friends had played an important role in their decision.

71-1081. Hasleton, S. **The Incidence and Correlates of Marihuana Use in an Australian Undergraduate Population.** *Medical Journal of Australia* 2(6):302-308, August 7, 1971.

A random sample of 168 first- and second-year students in the Faculties of Arts and Science at the University of Sydney were questioned about marihuana use, and the social and academic correlates of their drug use were established. The sample was also tested on the Eysenck Personality Inventory and the Anderson and Western Student Attitude Inventory. Results indicate that about 18 percent of students have used marihuana at this stage of their career. The modal user is male, living away from home in shared accommodation. He is unlikely to have any formal religious affiliation, and he has been exposed to a variety of other drugs. Users tend to be somewhat extrovert, radical, and open-minded. From responses to questions concerning the use of tobacco, it was evident that users are not substituting marihuana for tobacco. Only 50 percent of the total users are nonsmokers, while 77.5 percent of the non-users are nonsmokers. While only 2.2 percent of the non-users are heavy smokers (smoke more than 100 cigarettes per week), 13.3 percent of the combined users are heavy smokers of tobacco. Smoking marihuana involves drawing a lungful of smoke into the chest and holding it there for as long as possible. This is reportedly very difficult unless the normal rejection response has been attenuated by exposure to tobacco. The carcinogenic properties of cannabis compared with those of tobacco have not yet been determined, but even if the use of cannabis alone proves to be less dangerous than smoking ordinary cigarettes, the effects of combined cannabis/tobacco smoking will also need to be examined.

71-1082. Klonglan, G. E., Paulson, S. K. **Coordinating Health Organizations: The Problem of Cigarette Smoking.** Department of Sociology and Anthropology, Iowa State University. Ames, Iowa, Sociology Report 90, June 1971, 283 pp.

Many public and private health organizations have addressed themselves to the health-damaging problem due to smoking with the intent of reducing the incidence of cigarette smoking. One major obstacle to success has been overlap and duplication of effort resulting from independent activities of the organizations which further results in an inefficient use of resources. A more efficient approach might be through coordination where each organization carries out parts of programs which are compatible with those carried out by other organizations and are best suited to the organization's resource capabilities. The research reported in this study is concerned with both issues, that is, the coordination of organizations and the health problem of cigarette smoking. The general objective of the research was to determine what intra-organizational characteristics and preconditions are necessary for the establishment and maintenance of coordinated efforts among health-related organizations in the area of cigarette smoking and health.

71-1083. Klonglan, G. E., Beal, G. M., Paulson, S. K., Warren, R. D., Fleischman, W. A. **The Potential of Organizational Coordination as an Intervention Process: Applied to the Problem of Cigarette Smoking and Health.** Department of Sociology and Anthropology Iowa State University, Ames, Iowa, Sociology Report 91, June 1971, 78 pp.

This report brings together findings and implications of two separately reported but related research studies. These studies were conducted for the National Clearinghouse for Smoking and Health in an attempt to better understand (1) the cigarette smoking behavior, attitudes and beliefs of nonmetropolitan residents, (2) the knowledge, opinions and use of nonmetropolitan health-related organizations by such residents, and (3) the interaction among such organizations particularly with respect to their commitment to involvement in the health problem of cigarette smoking. Specifically, the major concern of this report is to explore alternatives for intervention in the health problem of cigarette smoking focusing on coordination of organizations in rural (nonmetropolitan) areas. The ultimate objective of alternative intervention program is, of course, to bring about change in individual's smoking behavior.

71-1084. Mausner, B., Platt, E. S. **Smoking: A Behavioral Analysis.** New York, N.Y., Pergamon Press, 1971, 238 pp.

The first part of this book describes a series of investigations into the natural history of cigarette smoking; the second describes an experimental attempt to induce change in smoking habits. The initial studies in the first part consist of analyses of descriptive material drawn from interviews, questionnaires, and diaries furnished by a variety of groups of smokers. In two of these studies the interrelationships of different kinds of reports from individual smokers are examined. Questionnaire data on the role played by smoking in the lives of a group of young men and their beliefs about the consequences to themselves of continuing to smoke or stopping are then analyzed. These data on beliefs and patterns of support for smoking were related to measures of personality traits. Implications are presented for psychological research into the design of control programs in other areas in which people must sacrifice immediate gratification for long-range benefits.

71-1085. Newman, I. M. **Ninth Grade Smokers–Two Years Later.** *Journal of School Health* 41(9):497-501, November 1971.

Forty smokers and forty nonsmokers were studied for a three-year period in order to examine changes in social status, peer group membership, and the achievement of their parents' and schools' expectations which were initially related to cigarette smoking. Smoking was found to be significantly related to social status for females, but not for males at the beginning and end of the three-year period. In the eyes of her peers, smoking "typed" a female and associated her with a lower social status position than was granted most nonsmokers. Males, however, appeared to be free of any social demotion resulting from cigarette smoking. Smoking was closely related to peer group membership, and peer group memberships related closely to each individual's position in the social status system. Among those who either quit smoking or took up the habit, there appeared to be a related change in status and peer group membership. In ninth graders, smoking behavior was significantly related to the extent to which they felt they were actually meeting their parents' and schools' expectations. No such relationship existed by the end of the eleventh grade which indicated that the earlier smokers, who felt they were not achieving others' expectations, had dropped out of school, quit smoking, or learned to achieve and meet others' expectations.

71-1086. O'Rourke, A., Wilson-Davis, K., Gough, C. **Smoking, Drugs and Alcohol in Dublin Secondary Schools.** *Irish Journal of Medical Science* 140(5):230-241, 1971.

A questionnaire survey was made of smoking, drug and alcohol habits of secondary school children in Dublin. Results showed a higher incidence of smoking among Dublin boys under 14 years of age as compared with the incidence in British surveys. Over age 14 there was little difference between the samples. Over two-thirds of the boys aged 12 or under had tried smoking. The proportion who smoke regularly increased with age but this increase in regular smokers came only from boys who experimented with smoking–there was no age trend among the nonsmokers. Among the girls, a significantly lower proportion smoked at each age than the boys. Boys smoked significantly more cigarettes than girls. In boys, the mean number of cigarettes smoked steadily increased from 18.4 cigarettes/week for those 12 years old and under to 59.9 cigarettes/week for those 17 years old and over. In girls, the corresponding figures were 13.5 and 33.2. A comparison with regular smokers surveyed in 1967 showed an increase in the present group in smoking in all age groups in both boys and girls, excluding the 18+ age group in the boys. Parental knowledge of their child's smoking was positively correlated with the child's age. Parental approval increased with the child's age, but even in the 17-year old or over group, two-thirds of the parents disapproved. Even parents who smoke disapproved of their children's smoking habits. There was a positive correlation between parental smoking habit and their daughter's habit but no positive association in the boys. The vast majority of the children recognized that smoking was harmful to their health, even 82 percent of the regular smokers. Over 9 percent of the boys and 6 percent of the girls stated they had been offered drugs. Two percent of the children had taken drugs. The type of drug offered and taken most often was marihuana, followed by LSD, pep pills, heroin, morphine/opium, barbiturate and cocaine, in that order. Regular smokers were more prone to come in contact with drugs than nonsmokers. Nearly three-fourth of the children had taken an alcoholic drink with 13 percent of the boys and 10 percent of the girls stating they were regular drinkers.

71-1087. Phillips, A. J. **The Smoking Habits of Professional Groups in Canada.** In: UICC Technical Report Series, Volume 6: Public Education About Cancer. Recent Research and Current Programmes, 1969. Geneva, Union Internationale Contre le Cancer, 1970, pp. 34-37.

A sample survey of the smoking habits of Canada's doctors, nurses, and teachers showed that the proportion of smokers among these groups is below that for the population of Canada as a whole. Approximately one-third of the nurses and teachers, and 45 percent of the doctors have stopped smoking cigarettes. Ex-smokers reported "belief in scientific evidence" and "relief of respiratory symptoms" as the most common reasons for having quit smoking. The incidence of smoking among doctors was found to be highest in those living in towns whereas among nurses and teachers, it was higher in cities.

71-1088. Read, C. R. **The Teenager Looks at Cigarette Smoking.** In: UICC Technical Report Series, Volume 6: Public Education About Cancer. Recent Research and Current Programmes, 1969. Geneva, Union Internationale Contre le Cancer, 1970, pp. 97-104.

The results of an American Cancer Society survey of smoking beliefs and behavior in young people ages 13 to 18 years are presented. Only 21 percent of current teenage smokers and 2 percent of nonsmokers predict that they will be smoking in 5 years. Three out of five youngsters ages 13 to 18 have tried cigarettes but only 27 percent are current smokers (defined as having smoked at least one cigarette in the last 30 days). Smoking is light in comparison with adults: 95 percent of all youngsters report smoking less than a pack a day. One quarter of those who ever smoked had their first cigarette by the time they were 10, another quarter when they were 11 or 12, one-third when they were 13 or 15, and the rest from 15 on up. Both smokers (65 percent) and nonsmokers (86 percent) believe smoking is a cause of cancer. Cigarette smoking among teenagers is inversely related to academic achievement and aspiration. Reasons for smoking are largely social. Among smokers, reasons for disliking the habit were mostly related to economics, health, and difficulty in quitting. Smokers, as compared to nonsmokers, are more socially precocious, more adventurous, and manifest a greater inclination to move into the adult world. Where friends, siblings, parents, and other frequently seen adults smoke, youngsters are more likely to take up the habit. When teenagers feel their parents understand them, the youngsters are less likely to smoke. Influential adults who had told youngsters not to smoke included parents, teachers, adult youth club leaders, doctors, and friends. The considerable percentage of teenagers who have tried cigarette smoking and quit, and the fact that the number of cigarettes consumed by smokers is relatively small suggests that the habit is not yet deeply rooted in most of the current smokers. Teenagers are aware of anti-cigarette commercials, report having anti-cigarette programs in school, and are familiar with the warning label on cigarette packages. How teenagers resolve the conflict between the youth and adult worlds is closely linked with how they resolve the problem of the cigarette habit. When, where, and with whom teenagers have their first cigarette is not considered critical in determining whether or not their smoking habit is continued.

71-1089. Robbins, P. R., Tanck, R. H., Meyersburg, H. A. **Psychological Factors in Smoking, Drinking, and Drug Experimentation.** *Journal of Clinical Psychology* 27(4):450-452, October 1971.

An attempt was made to relate measures of smoking, drinking and drug experimentation in college students to scores from personality tests. The study yielded a replication of earlier findings that the Minnesota Multiphasic Personality Inventory (MMPI) P_D scale tended to relate to both smoking and experimentation with drugs. Other than the P_D scale, however, no test score correlated significantly with any two of the social health habits considered. Smoking was positively correlated with the neurotic scales of the MMPI, with the Dream Incident Technique (DIT) scale for aggression, and with reports of psychological problems. Smoking was negatively correlated with measures of achievement. While the findings for drinking were limited in that the sample included few heavy drinkers, almost all results obtained were nonsignificant. Positive relationships were found between drug experimentation and the DIT measures of tension relating to autonomy and affection.

71-1090. Rode, A., Shephard, R. J., Ross, R. **Smoking and Personality.** *American Review of Respiratory Disease* 104(6):929-932, December 1971.

The psychologic characteristics of 336 men and 265 women attending a smoking withdrawal clinic were assessed by the Cattell 16 factor test. Findings showed that the population had different sexual attributes of personality than the usual mixture of smokers and nonsmokers, and in many instances, the sex role was reversed. The men were affected by their feelings, expedient, shy, and imaginative, whereas the women were assertive, self-opiniated, forthright, and self-sufficient. Other characteristics contributing to the smoking habit in the men included lack of discipline and tension, and in the women a tender-minded, dependent aspect of personality, emotional instability, expedience, shyness, apprehension, lack of self-discipline, and tension. In men, the ability to resist the pressure to smoke and to quit smoking was linked with an experimenting, critical mind, whereas an assertive, independent spirit and lack of tension were characteristic of the nonsmoker. In women, an apprehensive, worrying personality was the most significant characteristic of the continuing smoker. Previous reports that smokers are independent, resistant to suggestion, and extroverted were not confirmed in this study. The data indicate that it is the nonsmoker who is independent and resistant to suggestion and that shyness and lack of confidence in a crowd may contribute to the smoking habit.

See also **71-1099**

71-1091. Schmidt, F. **Sind Raucher "andere" Menschen? [Are Smokers "Different" People?]** *Selecta* 3:240, 242, January 19, 1970, German.

Prof. Arthur Jores of Hamburg is criticized for making misleading statements in minimizing the harmfulness of cigarette smoking. In an interview reported in the daily press, he had shrugged off the findings of the Terry Report showing the relation of smoking to lung cancer as being based merely on statistics, ignoring the effects of smoking on other organs, and ignoring the numerous large-scale studies on humans and the mass of evidence based on animal experimentation. According to Jores, 10 cigarettes per day does not cause damage to the human organism. To counter Jores statements, Schmidt referred to the findings of Hammond's study on twins, Eyesenck's linking of personality, smoking and lung cancer, Doll and Hill's study on over 40,000 British physicians, and the observations of a practicing physician, Dr. Lothar Krekel, linking smoking with angina pectoris and lung cancer. The appearance of Jores' statements in a newspaper rather than in a reputable journal was considered as evidence of an attempt to mislead the casual reader.

71-1092. Simmons, H. E. **Your Psyche, the Cigarette and the Pill. The Psychogenic Theory of Disease.** Sacramento, California, General Welfare Publications, 1969, 260 pp.

A theory of psychogenic disease is presented which suggests that some diseases originate in the psyche and develop as glandular reactions to emotions. Asthma, arthritis, congestive heart ailments, diabetes, epilepsy, ulcers, colitis, skin disease, multiple sclerosis, thyroid disease, and cancer are among the diseases postulated as psychogenic because in them tissue responds to glandular malfunctioning caused by emotional stress. The disease-producing emotional stress, the glandular products catalyzed by the stress, and the disease caused by the resulting hormonal imbalance are discussed. Psychogenic theory suggests that many lung ailments have their genesis in the psyche, that lung cancer may be one of the conditions caused by emotional stress, and that cigarette smokers may have significantly different emotions than the nonsmoking population. Psychogenic theory also suggests that emotional stress in combination with the ingestion of contraceptive pills may cause serious disease.

BILLS AND LEGISLATION

71-1093. Schmidt, F. **Uber den Zigarettentod. Erganzungen und Kommentare. [On Cigarette Deaths. Supplement and Commentary.]** *Deutsches Arzteblatt* 67(29):2288-2291, July 18, 1970, German.

After some background on the harmfulness of cigarette smoking, several German health statutes are cited as the legal basis for proceeding against the manufacture and sale of cigarettes as hazardous substances. A prohibition on radio and television cigarette advertising and a heightened educational program are urged to protect the health of juveniles. The German legislature is also asked to authorize compulsory labeling of tar and nicotine content on cigarette packs. The moderate nature of this last request is emphasized by the fact that in the United States, manufacturers must print health warnings on cigarette packs. The protection of nonsmokers in public places and work areas is also viewed as a must. Doctors are urged to support these measures.

71-1094. U.S. Federal Communications Commission. **On Petitions for Review of Orders of the Federal Communications Commission.** United States Court of Appeals for the District of Columbia, Nos. 21,285, 21,525, 21,526, and 21,577, decided November 21, 1968.

Petitions to the U.S. Court of Appeals for the District of Columbia Circuit for review of orders of the Federal Communications Commission by petitioners John F. Banzhaf, III, Station WTRF-TV, the National Association of Bradcasters, the Tobacco Institute and eight cigarette manufacturers are reviewed. These appeals challenge the FCC's ruling requiring radio and television stations which carry cigarette advertising to devote a significant amount of broadcast time to presenting the case against cigarette smoking.

71-1095. U.S. Federal Communications Commission. **Petition for Review of a Report and Order of the Federal Communications Commission.** United States Court of Appeals for the Fourth Circuit, No. 15,382, argued May 5, 1971, decided August 20, 1971.

In a petition for review of a report and order of the Federal Communications Commission by the Tobacco Institute and a number of cigarette manufacturers, the U.S. Court of Appeals for the Fourth Circuit affirmed the FCC's ruling that radio and television licensees who broadcast announcements discouraging cigarette smoking as a health hazard are not required by the fairness doctrine to grant time for the presentation of opposing views.

SMOKING CESSATION METHODS

71-1096. Anand, C. L. **Effect of *Avena sativa* on Cigarette Smoking, (Letter).** *Nature* 233(5320):496, October 15, 1971.

The effect of *Avena sativa*, a drug derived from common oats, was studied in a group of 26 cigarette smokers. The drug was chosen because it has been used successfully in India to cure the opium habit. Healthy volunteers and chronic patients in the chest wards of Ruchill Hospital, Glasgow, including tuberculous patients participated in the trial. The total duration of their smoking habit and the average number of cigarettes smoked per day in the six preceding months were recorded. They were told that a drug was being tested which might affect their smoking, and that they were to make no conscious effort to alter their smoking during the trial. Thirteen patients were selected randomly to receive the drug and the others received a placebo for 28 days. In the drug group, the total daily consumption by 13 patients dropped from 254 cigarettes to 74 by the end of the trial. Five had stopped smoking, seven had reduced consumption to less than 50 percent, and in one no change had occurred. In the placebo group, total daily consumption actually increased from 215 cigarettes to 217. Smoking had been stopped by none, reduced to above 50 percent by six, and increased by three; four reported no change. The drug seems to reduce the number of cigarettes smoked per day, along with diminished craving for smoking.

71-1097. Augendre, P., Cousin, M., Lagarde, J.-P., Matton, A. **"Le Plan de Cinq Jours" ou "Une Desintoxication Tabagique Controlee." ["The Five-day Plan" or "A Controlled Tobacco Detoxification."]** *Concours Medical* 93(19):3480-3486, May 8, 1971, French.

The proceedings of an antismoking forum in February 1971 concerning the operation of the Five-Day Plan in the village of Salers are reported. The four participants in the forum discussed the origins of the Plan from its beginnings in 1954, the basis for its application, the manner in which smoker volunteers are recruited, and the conduct of the sessions. The villagers of Salers were not recruited in the usual manner and the treatment had been irregular because of the lack of preparation. The immediate results of the Five-Day Plan are considered very satisfactory–85 to 95 percent success in those who completed the entire course–but the long-term results were expected to be much lower. J. L. Schwartz's criticisms of the methods, results, and criteria for evaluating the efficacy of the Five-Day Plans are noted.

71-1098. Conrad, F. G. **Smoking-Withdrawal Clinics. (Letter)** *New England Journal of Medicine* 285(1):60, July 1, 1971.

Of 52 persons attending a five-day smoking-withdrawal clinic at Wilford Hall USAF Medical Center, Lackland AFB, Texas, 40 stopped smoking, but only 7 maintained abstinence until the end of the year. Most of the group relapsed during the first month and 73 percent were smoking again by the end of two months. This low success rate is similar to those of other clinics conducted over the past seven years.

71-1099. Hunt, W. A., Barnett, L. W., Branch, L. G. **Relapse Rates in Addiction Programs.** *Journal of Clinical Psychology* 27(4):455-456, October 1971.

Based of 84 studies containing smoking cessation data, a typical "extinction" curve of the relapse rate over time is described and discussed. The curve is marked by a steep decline during the first three months, by a subsequent gradual leveling off, and by an asymptotic level well above zero. The high incidence of relapse or "backsliding" during the first three months would indicate that even disregarding those failures who never do manage to stop smoking despite treatment, treatment methods as presently practiced make only a moderate impression on those who do manage to stop. Either the usual treatment period is too brief or the methods too inefficient to produce a lasting effect. The majority of "patients" need some further supportive or booster treatment during the first six months after successful completion of therapy. The observation is made that there may be some personality and/or physiological characteristics attributable to those persons treated (approximately 20 percent) who never return to smoking. Relapse curves for heroin and alcohol addiction are compared to the smoking curve, and a remarkable similarity is observed in the curves from these three areas of drug behavior.

See also **71-1025**

GENERAL

71-1100. Horn, D. **The Smoking Problem in 1971. (Unpublished)** Presented at the American Cancer Society's 13th Annual Science Writers' Seminar, Phoenix, Arizona, April 6, 1971, 12 pp.

The percentage of adult male smokers has dropped from 52 percent in 1966 to 42 percent in 1970, and among women from 34 to 31 percent for the same period. In 1964 and in 1966, 76 percent of the adult population felt that cigarette smoking was enough of a problem for something to be done about it. By 1970, 86.5 percent felt this way. The anti-smoking commercials on television in 1969-1970 are probably the reason for this widespread change. In 1964 and again in 1966, 13 percent of the adult population rejected the idea that smoking is harmful to health, while in 1970 the percentage dropped to 7 percent. In both 1964 and 1966, 45 percent of the population agreed that cigarette advertising should be stopped completely. By 1970, it was up to 60 percent. Negative reactions to being in the presence of smokers rose from 46 percent in 1964 to 48 percent in 1966 and to 58 percent in 1970. In the period from 1964 to 1966, 36 percent of the smoking population tried to give up smoking and 20 percent were successful for a net success rate of 7 percent. From 1966 to 1970, 61 percent tried to quit smoking and 36 percent were successful for a net success rate of 22 percent. Being very concerned about the possible effects of smoking on your own health increases the likelihood of thinking about the problem and deciding to do something about it. However, it reduces the likelihood of both short and long term success for those who try. Responses of smokers, asked in 1966 if they would be smoking five years later, were found to be highly predictive of the entire process of giving up smoking during the next four years. The feeling that it would be very hard to give up smoking was another important factor in predicting whether or not people gave up smoking over that four-year period. One of the most important predictors of success in giving up smoking was the number of cigarettes smoked per day in 1966: the more cigarettes smoked, the harder it was to give up smoking. Future anti-smoking programs should include more activities that stress decision-making, offer more help on the long-term staying off of cigarettes for those who have managed to quit, and promote less hazardous smoking and less hazardous cigarettes for smokers who feel incapable of quitting.

71-1101. Read, C. R. **Why Do We Advertise the Chief Cause of Lung Cancer?** *Occupational Health Nursing* 19:9-11, July 1971.

The decline in cigarette smoking among adults over the past five years and the effects on this decline of recent anti-cigarette television messages and of recent scientific and medical findings incriminating smoking as a major cause of disease are discussed. Smoking behavior and risks among women and the fact that women are now a major advertising target are emphasized. Efforts by the Federal Trade Commission and the American Cancer Society to require the tobacco industry to carry tar and nicotine contents and a warning to smokers in their advertisements and to generally curb cigarette advertising are described.

71-1102. Russell, M.A.H. **Smoking in Britain: Strategy for Future Emancipation.** *British Journal of Addiction* 66(2):157-166, September 1971.

The health cost of smoking in Britain, the national response to the problem, and the reasons for failure to control it more effectively are discussed. A future antismoking strategy should hinge on the two interacting key factors that maintain smoking, the dependence factor and the favorable social climate. Any tactic or measure that diminishes the effect of either of these factors should also diminish smoking. In the absence of an effective treatment applicable to large numbers of dependent smokers and with lack of fundamental knowledge of the nature of dependence, the ability to overcome the dependence factor is at present rather limited. But much could be done to intensify research in this area. On the other hand, the engineering of a change of social climate to one less favorably disposed towards smoking is quite feasible and potentially highly effective. This would, however, require a coordinated sustained intervention on a national scale, with a multi-disciplinary organizing committee closely backed by the Government with adequate financial and legislative support. It would not be sufficient merely to curb commercial promotion of cigarettes; but it would be necessary to accompany this with antismoking propaganda of a commercial advertising type and scale. Continuous evaluation and public reaction monitoring would be required to ensure maximal efficacy of such tactics as selective tax increases, tighter control of sales outlets, and restriction of smoking in public places. (Auth. Abs.)

71-1103. Schmidt, F. **Warum U.S.-Lebensversicherungen die Beitragssatze fur Nichtraucher ermassigen. Ein nachahmenswertes Beispiel. [Why U.S. Life Insurance Companies Reduce Premium Rates for Nonsmokers. An Example Worth Mentioning.]** *Deutsche Versicherungszeitschrift* 4:96-97, 1971, German.

Dr. Schmidt's 3-week study trip which he made with Dr. Portheine in December 1970 for the purpose of investigating antismoking measures in the United States, is briefly reported. A fuller account of the trip is in press. Schmidt feels that a real breakthrough has taken place in the United States in changing public opinion with regard to smoking and in reducing cigarette consumption in 1969 and 1970. Reductions in life insurance premiums for nonsmokers in the United States has been attributed to the findings of numerous investigations, starting with the 1964 Terry Report. There are also some statistics presented by Hammond to the World Conference on Smoking and Health in New York in 1967, demonstrating the increased mortality rates of male and female smokers, and statistics based on a study of about 300,000 U.S. army veterans showing increased lung cancer and emphysema mortality and an increase in the incidence of myocardial infarct due to smoking. The results of a National Health Survey Report showing a greater loss of days from work and more bed care for smokers in the United States as compared with nonsmokers, are arranged by age and sex in a table.

71-1104. Schmidt, F. **Beschlusse des Arztlichen Arbeitskreises Rauchen und Gesundheit auf der 1. Jahreshauptversammlung am 27. 2. 1971 in Mannheim. [Resolutions of the Medical Work Group for Smoking and Health at the First Annual Meeting on February 2, 1971 in Mannheim.]** *Zeitschrift fur Allgemeinmedizin der Landarzt* 47(18):959-960, June 30, 1971, German.

A 10-point program described includes legal protection for nonsmokers, prohibition on tobacco advertising, acceptance of the American "Fairness Doctrine" for radio and TV advertising, printed warnings on cigarette packs, a 50-percent increase in cigarette taxes, continuing control of tar and nicotine content of cigarette brands, a ban on cigarette vending machines in public places, prohibition on sale to minors, protection of health of the fetus, and promotion of detoxification centers. General recommendations include nonsmoker direction for detoxification centers, worker sick-funds to pay for detoxification centers, encouragement of detoxification by offering lower sick-fund rates or premiums for nonsmokers, discontinuance of indirect cigarette advertising on TV or in films, and an appeal to smoking physicians to set an example for the public and not to hinder antismoking measures.

71-1105. Terry, L. L. **Rauchen–Selbstmord in Raten. Gibt es noch Hilfe? [Smoking–Slow Suicide. Is There Any Hope?]** *Rehabilitation, Sozialmedizin, Physikalische Medizin, Praventivmedizin; Internationale Zeitschrift mit Zentralblatt* 24(3):33-37, September 1971, German.

Cigarette smoking is the leading cause of self-induced disability, disease, and death in the U.S. and in many other countries. The relation of cigarette smoking to lung cancer, non-neoplastic lung disease, cardiovascular disease, and general disability is discussed in detail. On this basis, those habituated to cigarette smoking are urged to question their dependency which compromises their future good health.

CHEMISTRY, PHARMACOLOGY AND TOXICOLOGY

71-1106. Agurell, S., Leander, K. **Stability, Transfer and Absorption of Cannabinoid Constituents of Cannabis (Hashish) During Smoking.** *Acta Pharmaceutica Suecica* 8(4):391-402, September 1971.

The cannabinoids of a hashish preparation were determined qualitatively and quantitatively. A group of Cannabis smokers using this preparation obtained a 14-20 percent transfer of the cannabinoids present in the hashish cigarette to the respiratory system. These results agree with experiments using tobacco cigarettes impregnated with pure cannabinoids, showing a 14-20 percent transfer with the main stream of smoke. While cigarette smoking made only 14-20 percent of the cannabinoid constituents of hashish available to the smoker, this figure was increased to about 45 for pipe smoking. The experienced Cannabis smokers using deep inhalations absorbed over 80 percent of the cannabinoids in the main stream smoke. There is no difference in the transfer of cannabinoids using the deep inhalation technique, when compared to normal superficial smoking. Except for decarboxylation of cannabinoid acids, there is no substantial difference between the major cannabinoids of the smoke as compared to the drug itself. That the smoking process causes only limited changes in the cannabinoid fraction was also shown by smoking pure delta^1-tetrahydrocannabinol, cannabidiol, cannabinol, and cannabidiolic acid. The present results indicated that to achieve a "normal biological high" by smoking, the absorbed dose of delta^1-tetrahydrocannabinol was in the range of 3-5 mg for the tested persons. The results further indicate a rather rapid fall in the content of delta^1-tetrahydrocannabinol in stored hashish, partly due to the transformation to cannabinol. A gas chromatographic method for the determination of cannabinoids, using triphenyl carbinol as internal standard, is presented.

71-1107. Beckett, A. H., Gorrod, J. W., Jenner, P. **The Analysis of Nicotine-1'-N-Oxide in Urine, in the Presence of Nicotine and Cotinine, and Its Application to the Study of In Vivo Nicotine Metabolism in Man.** *Journal of Pharmacy and Pharmacology* 23(Supplement):55S-61S, December 1971.

A rapid quantitative assay for nicotine-1'-N-oxide in urine, in the presence of nicotine and cotinine, is reported. The urinary excretion of nicotine, cotinine, and nicotine-1'-N-oxide was determined after nicotine had been administered in cigarette smoke, orally, or intravenously to subjects with either fluctuating, controlled acidic, or controlled alkaline urinary pH. The urinary excretion of the N-oxide in 24 hours from smokers under normal conditions was about half that of the cotinine excretion; more trans- than cis-diastereoisomer of nicotine-1'-N-oxide was excreted. (Auth. Abs.)

71-1108. Beckett, A. H., Gorrod, J. W., Jenner, P. **The Effect of Smoking on Nicotine Metabolism In Vivo in Man.** *Journal of Pharmacy and Pharmacology* 23(Supplement):62S-67S, December 1971.

Nicotine and a basic metabolite, cotinine, were determined in the urine by gas-liquid chromatography after intraveous administration of (−)-nicotine hydrogen (+)-tartrate to groups of male and female smokers and nonsmokers in whom the urine was maintained at an acid pH. The urinary recoveries of nicotine and cotinine from male smokers fell in two groups. One showed a lower recovery of both alkaloids than was seen with male nonsmokers. The other showed a similar recovery of nicotine but more cotinine than the male nonsmokers. Female smokers excreted less nicotine but more cotinine than female nonsmokers. More nicotine but less cotinine was excreted by female nonsmokers than by male nonsmokers. The results show that sex-dependent metabolism of nicotine occurs in nonsmoking humans and that smoking causes alterations in nicotine metabolism. (Auth. Abs.)

71-1109. Bhown, A. S., Maitrya, B. B., Bhown, M. **Ammonia Retention by Smokers: A Comparative Study.** *Indian Journal of Medical Research* 59(8):1296-1299, August 1971.

Inhalation and retention of ammonia by cigarette smokers, smoking cigarettes with and without filter tip, and bidi smokers have been quantitatively estimated and the results compared. It has been concluded that bidi smokers retain twice as much the amount of ammonia as is retained by cigarette smokers. No difference however, could be detected between the two types of cigarette smokers. (Auth. Abs. Mod.)

71-1110. Bilimoria, M. H., Nisbet, M. A. **The Differentiation of Tobacco Smoke Condensates on the Basis of Reducing Properties.** *Beiträge zur Tabakforschung* 6(1):27-31, July 1971.

Condensates obtained by smoking cigarettes, cigars, and pipe tobacco have been compared on the basis of their abilities to reduce cytochrome C and dichlorophenolindophenol. Most market brands of flue-cured cigarettes, while differing on the basis of total reducing activities, give similar values when reducing activity is expressed as specific activity (reducing activity per mg particulate matter). Condensates from blended cigarette brands containing other types of tobacco in addition to flue-cured, have lower specific activities. Special types, such as cigarettes made from 100 percent reconstituted tobacco and a ventilated cigarette also give lower values. Both cigars and pipe tobaccos give condensates with distinctly lower specific activities than those obtained from flue-cured cigarettes. In the case of pipe tobacco, a large amount of water accumulates on the Cambridge pads and has to be taken into account when calculating specific activities. (Auth. Abs.)

71-1111. Bilimoria, M. H., Nisbet, M. A. **Effect of Tobacco Smoke Condensates on Ascorbate.** *Beitrage zur Tabakforschung* 6(1):32-35, July 1971.

Ethanolic extracts of tobacco and tobacco smoke contain compounds capable of accelerating the oxidation of ascorbate. Using a polarographic technique, smoke from cigarettes, cigars, and pipe were examined for oxidizing properties. Smoke from Virginia cigarettes showed greater activity than that from blended cigarettes, while smoke from cigars and pipes had even lower activity. The reaction of ascorbate and smoke has been shown by electron paramagnetic resonance to involve a radical intermediate. (Auth. Abs.)

71-1112. Birnstingl, M. A., Brinson, K., Chakrabarti, B. K. **The Effect of Short-Term Exposure to Carbon Monoxide on Platelet Stickiness.** *British Journal of Surgery* 58(11):837-839, November 1971.

Prolonged exposure to carbon monoxide accelerates the development of atheroma in rabbits owing to intimal accretion of platelets and fibrin and intramural lipid accumulation. A group of 7 rabbits was exposed in a closed chamber to an atmosphere containing 400 ppm CO for 6-14 hours on several occasions. Platelet stickiness was estimated by a modified Hellem's glass-bead method immediately after exposure and on the following day, for comparison with values in the resting period prior to exposure. There was a highly significant increase in platelet stickiness immediately after exposure to CO, followed the next day by a significant fall below the pre-exposure value. The increase in platelet stickiness after CO exposure may provide a link between tobacco smoking and peripheral vascular disease. (Auth. Abs. Mod.)

71-1113. Cohen, S. D., Nicholas, B. A., Jenkins, H. J. **Classification of Nicotine Block at Neuromuscular Junction.** *Journal of Pharmaceutical Sciences* 60(11):1740-1742, November 1971.

The effect of nicotine on the electrical threshold of the neuromuscular junction in a rat sciatic-gastrocnemius preparation was studied and compared with the effects of a true curarizing agent and those of a pseudocurarizing agent on the threshold of the like structure of the same preparation. Low doses of both nicotine and succinylcholine chloride caused a decrease in the predrug electrical threshold level of the neuromuscular junction, while high doses of these drugs caused an elevation of the predrug threshold level. Both low and high doses of dimethyl tubocurarine chloride, on the other hand, caused an elevation in this threshold level. Eserine salicylate enhanced the early blockades caused by nicotine and succinylcholine chloride but opposed the late blockades caused by these same drugs. Eserine salicylate opposed both the early and the late stages of a neuromuscular blockade brought about by dimethyl tubocurarine chloride. Nicotine and succinylcholine chloride induced a spastic paralysis in chicks, whereas dimethyl tubocurarine chloride induced a flaccid paralysis in other chicks of the same age and weight. On the basis of these studies, nicotine is classified as a neuromuscular blocking agent of the pseudocurare type which does not exert its effect through acetylcholine release. (Auth. Abs.)

71-1114. Driscoll, P., Deuber, A. **Die Wirkung von filtriertem Zigarettenrauch auf den Kohlenmonoxid-Hamoglobin-Spiegel und die Atmungsferquenz der Ratte. [The Effect of Filtered Cigarette Smoke on the Carbon Monoxide-Hemoglobin Level and the Respiration Frequency in Rats.]** *Zeitschrift fur Praventivmedizin* 16:413-414, 1971, German.

The frequency of respiration in rats exposed to gas phase (Cambridge and wood charcoal filtered) and gas-vapor phase (Cambridge filtered only) smoke was measured and the results then compared with the percentages of carboxyhemoglobin (COHb) in each animal directly after a 30-second exposure. Two types of 85-mm non-filter cigarettes were used in the tests, a commercially available cigarette (A) and a specially prepared test cigarette (B). The animals were tested in a latin-square sequence. The results showed all percentages of COHb, with the exception of Cigarette A gas phase and Cigarette B gas-vapor phase, differed significantly. The frequency of respiration for the gas-vapor phase was only about one-third that of gas phase respiration but the differences in COHb percentages were much narrower. No explanation for the differences in the COHb percentages could be found in a study of the test parameters of the two cigarettes. It was concluded that differences other than in respiration rate could affect the degree of alveolar ventilation and thus the absorption of carbon monoxide. Animals later given a 15-second exposure to whole or charcoal-filtered smoke showed great variability in the respiration rate of the individual animals.

71-1115. Elmenhorst, H. **Nachweis von Maltol in Cigarettenrauch. [Detection of Maltol in Cigarette Smoke.]** *Beitrage zur Tabakforschung* 6(2):70-73, September 1971, German.

Maltol (2-hydroxy-3-methyl-4-pyrone) as a new tobacco smoke constituent was identified by thin layer chromatography and UV-spectrometry. After conversion into the methylether, by reaction with diazomethane, maltol was identified by gas chromatography and mass spectrometry. The amount of maltol in the smoke of a cigarette, made from tobacco without any additives, was 5 to 10 micrograms/cigarette. The occurrence of gamma-pyrone derivatives in tobacco smoke has not been reported until now. It might be possible that the newly found gamma-pyrone derivative is only the first representative of a new class of chemical smoke constituents (Auth. Abs.)

71-1116. Enzell, C. R., Bergstedt, E., Dalhamn T., Johnson, W. H. **Tobacco Chemistry. 4: Chemical and Ciliotoxic Studies of Smoke From Freeze-Dried Tobacco.** *Beitrage zur Tabakforschung* 6(1):41-50, July 1971.

Freeze-dried and corresponding conventionally cured tobacco have been subjected to comparative studies. The cigarettes manufactured from the freeze-dried tobacco have a noticeably lower average weight due to the higher filling capacity of this tobacco. This has little or no influence on the taste, but affects the burning rate considerably. Determinations of the amounts of total particulate matter, dry condensate, and nicotine in the smoke shows that these are about half in the case of the freeze-dried material when an equal number of cigarettes are smoked; they differ much less when an equal amount of tobacco or an equal number of puffs are used as the bases for comparison. However, the phenol content of the smoke is noticeably lower for the freeze-dried cigarettes. Examination of the ciliotoxic effect of the smoke from the two types of tobacco on rabbit trachea in vitro shows that there is no significant difference between the number of puffs required to achieve complete ciliostasis. A detailed gas chromatographic–mass spectrometric study using a high resolution glass capillary column and computerized data-acquisition demonstrates that there are no significant differences between the gas phases of the smoke derived from the two differently treated tobaccos. (Auth. Abs. Mod.)

71-1117. Hengy, H., Thirion, J. **The Determination of Thiodan and Thiodan Sulphate on Tobacco and in Smoke Condensate.** *Beitrage zur Tabakforschung* 6(2):57-61, September 1971.

A gas chromatographic method was developed for the quantitative determination of alpha and beta-Thiodan and Thiodan sulfate on tobacco and in smoke condensate in concentrations as low as 0.01 parts per million. A survey was made of the Thiodan and Thiodan sulfate content of leaf tobacco and cigarettes. Thiodan and Thiodan sulfate residues in leaf tobacco were found to amount to between 0.02 and 0.3 ppm and to between less than 0.02 and 0.05 ppm, respectively. Cigarettes manufactured from Virginia tobacco were found to contain between 0.1 and 0.2 ppm of Thiodan and less than 0.05 ppm of Thiodan sulfate. The transfer rate of Thiodan and Thiodan sulfate from cigarette tobacco into the mainstream smoke ranged from 14.5 percent to 16.3 percent. (Auth. Abs.)

71-1118. Ivanov, N. G., Paskaleva, K., Ivanov, N. Y., Atanasov, Y. **Vliyanie na Por'oznostta na Tsigarenata Khartiya Vurkhu Kondenzata na Dima i Negoviya Sustav. [Influence of Porosity of Cigarette Paper on the Smoke Condensate and Its Composition.]** *Bulgarski Tiutiun* 15(9):11-15, 1970, Bulgarian.

The effect of porosity on the components of cigarette smoke such as smoke condensate, nicotine, volatile phenols, carbonyl compounds, and aldehydes and ketones has been investigated. It was found that an increase in the porosity can influence the qualitative and quantitative properties of the smoke. An increase in porosity creates conditions for an average reduction of 25 percent of these substances, even without the use of a filter. The reductions are more pronounced when a filter is used. The acidity of the condensate and gas phase is not appreciably altered with the increased porosity of the paper.

71-1119. Lomonaco, T. **Breve Compendia de Medicina Aeronautica e Spaziale (Continuazione). [Brief Compendium of Aeronautic and Space Medicine (Continuation).]** *Minerva Medica* 62(71):3399-3402, September 22, 1971, Italian.

The harmful consequences of pilot exposure to various substances, particularly tobacco smoke and its principal constituents, are briefly summarized. Carbon monoxide by combining with hemoglobin of the blood can result in a severe anoxia. In a smoker consuming 30 cigarettes per day, the anoxia at ground level is equivalent to that found at an altitude of 2,000 meters, and at 3,000 meters the anoxia is equivalent to that found at an altitude of 4,500 meters. The stenocardia phenomena induced by smoking are aggrevated by anoxia. The spastic phenomena of blood vessels induced by nicotine are further aggrevated by the anoxia and especially by the low temperatures at the high altitudes encountered in flight. Immoderate use of alcohol has a harmful influence on the pilot, principally by reducing the utilization of oxygen. Combustion products of fuels, components of hydraulic fluids, and carbon tetrachloride from fire extinguishers also adversely affect the reactions of pilots in flight.

71-1120. Luderitz, P. **Experimentelle Untersuchungen uber die Wirkungen von Kohlenmonoxid aus Kraftfahrzeugabgasen auf den Gesundheitszustand von Verkehrspolizisten. [Experimental Studies on the Effect of Carbon Monoxide From Motor Vehicle Exhaust Gases on the State of Health of Traffic Police.]** *Zeitschrift fur die Gesamte Hygiene und Ihre Grenzgebiete* 17(9):645-646, September 1971, German.

Tests were carried out on 120 police (80 manual traffic controllers and 40 indoor controls) of a metropolitan area in the winter of 1968/69. A hexobarbital tolerance test demonstrated appreciable damage to the function of the central nervous system of the exposed personnel. Complaints of headache, fatigue, nausea, and vomiting were significantly more frequent in the outdoor personnel than in the indoor controls. The carboxyhemoglobin (COHb) values of the traffic controllers however did not exceed the values found in non-exposed smokers. Before the tests, the COHb values were significantly higher in the smokers than in nonsmokers but the absolute values at the end of the working day ranged from 4 to 7 percent which caused no acute injury to health. Because of the low COHb values, carbon monoxide does not appear to be the sole causative agent.

71-1121. Mokhnachev, I. G., Kanevcheva, I. S. **K Voprosu ob Issledovanii Sostava Tabachnogo Dyma. I. Kachestvennyy Sostav Aminov Tabachnogo Dyma. [Investigation of the Composition of Tobacco Smoke. I. Qualitative Composition of Tobacco Smoke Amines.]** *Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya* 1(56):62-63, 1967, Russian.

Paper chromatography was utilized for the qualitative analysis of the smoke of five brands of cigarettes: Lyubek, Amerikan 572, and Trapezand 2578, 1272, and 93. The analyses revealed the presence of the following amines: methyl, ethyl, propyl, butyl, amyl, dimethyl and trimethyl amines. Several unidentified bases were also detected in the smoke. Brand differences had no influence on the qualitative composition of the tobacco smoke.

71-1122. Montgomery, M. R., Rubin, R. J. **The Effect of Carbon Monoxide Inhalation on In Vivo Drug Metabolism in the Rat.** *Journal of Pharmacology and Experimental Therapeutics* 179(3):465-473, December 1971.

Previous studies have shown that the cytochrome P-450-containing hepatic mixed function oxidase system is inhibited in vitro by carbon monoxide (CO). This study reports that acute exposure to CO resulted in inhibition of in vivo drug metabolism in rats as measured by prolonged response to two drugs, hexobarbital and zoxazolamine. Exposure to CO for 90 minutes followed by drug testing in room air resulted in a significant prolongation of response to hexobarbital at a CO concentration of 1000 ppm and a significant prolongation of response to zoxazolamine at a CO concentration of 250 ppm. Exposure to the same CO levels for 90 minutes followed by drug testing in the CO environment resulted in significant enhancement of the CO-induced effect. The prolongation of the pharmacologic responses could be explained by a CO-induced inhibition of the hepatic mixed function oxidase enzyme system responsible for the metabolism of these compounds. Inhalation of atmospheres containing lowered oxygen concentrations also inhibited zoxazolamine metabolism. The data do not, as yet, allow a final conclusion to be made concerning the mechanism of the CO-induced effect, i.e., whether it is due to the direct effect of CO on P-450 or, alternatively, to an indirect effect of the induced tissue hypoxia. However, an initial approach to this problem has been made by establishing the concentrations of CO and lowered inspired oxygen required to produce equivalent alterations in drug metabolism. (Auth. Abs.)

71-1123. Neurath, G., Dunger, M., Kustermann, I. **Untersuchung der "Semi-Volatiles" des Cigarettenrauches. [Investigation of the "Semi-Volatiles" of Cigarette Smoke.]** *Beitrage zur Tabakforschung* 6(1):12-20, July 1971, German.

Six fractions of the steam volatiles of tobacco smoke condensate (semi-volatiles) were formed by column chromatography on silica gel. The constituents were identified by means of a combination of gas chromatography and mass spectrometry. About 320 compounds were indicated. Out of the 215 substances identified 69 have not been previously reported in cigarette smoke. (Auth. Abs. Mod.)

71-1124. Rosecrans, J. A. **Effects of Nicotine on Brain Area 5-Hydroxytryptamine Function in Male and Female Rats Separated for Differences of Activity.** *European Journal of Pharmacology* 16(1):123-127, September 1971.

Male and female rats separated according to differences in activity were administered five nicotine micro doses, and 5-hydroxytryptamine (5-HT) function estimated in diencephalon (Dien.) and brainstem areas of each experimental group. Chemical parameters were studied by comparing 5-HT accumulation in pargyline treated rats and it was observed that this factor was significantly lower in nicotine treated high activity rats of both sexes. These effects were most evident in the Dien. of the female, while brainstem areas were similarly affected in the male rat. 5-HT function appeared to be unaffected by nicotine in low activity rats, but there was some evidence that this system was stimulated, especially in the Dien. of the female rat (+ 31 percent). Correlations between the stimulatory effects of nicotine on activity and 5-HT accumulation in the high activity rat supported previous research which indicated that nicotine can inhibit this chemical system. Pooled data (high and low activity) reduced the significance of these findings providing further support for using such preselection techniques when attempting to study the pharmacology of a subtle psychoactive drug such as nicotine. Female rats appeared to be, chemically and behaviorally, more sensitive to nicotine which appeared to be somewhat related to the fact that female 5-HT accumulation was faster than that in similarly treated male rats. (Auth. Abs. Mod.)

71-1125. Schuller, D., Drews, C. J., Harke, H.-P. **Analytische Untersuchungen an Gasphasenkondensat. [Analytical Investigation of Gas Phase Condensate.]** *Beitrage zur Tabakforschung* 6(2):84-88, September 1971, German.

By the use of gas chromatographic and mass spectrometric methods gas phase condensate from cigarette smoke, isolated on a prepatative scale has been compared with the native gas phase from the smoke of the same cigarettes and investigated for qualitative composition. With regard to composition, there is a satisfactory conformity between both mixtures of substances. It has been possible to identify or to characterize more than 60 constituents. (Auth. Abs.)

71-1126. Seehofer, F., Wennberg, D. **Einfluss verschiedener Zugvolumenprofile auf Ausbeute und Zusammensetzung des Rauches beim maschinellen Abrauchen von Cigaretten. [Influence of Different Puff Volume Profiles on the Yield and Composition of the Smoke of Machine-Smoked Cigarettes.]** *Beitrage zur Tabakforschung* 6(1):7-11, July 1971, German.

A study was made of the effect of the puff profile on yield and composition of the mainstream smoke of cigarettes smoked on a RM 20/68 smoking machine producing three different puff profiles (square-shaped profile, early peak, and late peak profiles). The smoke was precipitated in an electrostatic trap. Crude condensate, dry condensate, smoke nicotine, phenols puff number, and draw resistance were determined. Significant differences were found between the dry condensate yields of two puff profiles and between the nicotine and phenol yields of all the three puff profiles. (Auth. Abs.)

71-1127. Segal, A., Katz, C., Van Duuren, B. L. **Structure and Tumor-Promoting Activity of Anthralin (1,8-Dihydroxy-9-anthrone) and Related Compounds.** *Journal of Medicinal Chemistry* 14(12):1152-1154, December 1971.

The compound anthralin, which is used for the treatment of skin diseases is shown to exist normally in the semiquinone form, that is 1,8-dihydroxy-9-anthrone. In Me_2CO or MeOH the compound spontaneously dimerizes and oxidizes to 1,8-dihydroxyanthraquinone. Anthralin dimer has the structure 1,6,7,12,18,21-hexahydroxy-5,12:6,11-di-*o*-benzo(*a,e*)cyclooctene. The fact that anthralin is a potent tumor-promoting agent in two-stage carcinogenesis should encourage an examination of tobacco tars, which have marked promoting activity for similar phenolic materials. Its transformation products and other related compounds were inactive in this assay. (Auth. Abs. Mod.)

71-1128. Spincer, D., Chard, B. C. **The Determination of Formaldehyde in Cigarette Smoke.** *Beitrage zur Tabakforschung* 6(2):74-78, September 1971.

A specific, sensitive method for the determination of formaldehyde in cigarette smoke is described employing the spectrophotometric detection of the product formed by reaction of formaldehyde with p-rosaniline and sulfur dioxide. The procedure is applicable to the analysis of smoke from cigarettes manufactured from flue-cured, burley, and fermented tobaccos. Smoking parameters and the use of Cambridge filters have been found to affect delivery markedly. The effect of several commercial filters on formaldehyde delivery has been examined. (Auth. Abs.)

71-1129. Stauffer, H. P., Bourquin, J. **Eine spektralphotometrische Methode zur Bestimmung von Formaldehyd im Vollrauch von Cigaretten. [A Spectrophotometric Method for the Determination of Formaldehyde in Whole Smoke of Cigarettes.]** *Beitrage zur Tabakforschung* 6(1):21-26, July 1971, German.

A simple method is presented for the estimation of formaldehyde in whole cigarette smoke. The procedure is based on the Hantzsch reaction between formaldehyde, acetylacetone, and ammonium ion in an aqueous buffer solution. The reaction product, 3,5-diacetyl-1,4-dihydrolutidine, has an absorption maximum at 412 nm and is measured spectrophotometrically. The operations are simple and there are no separation steps required. Reproducibility is excellent and interference by other carbonyl compounds can be neglected. Acetaldehyde in concentrations 10 times higher than formaldehyde interferes to less than 1 percent. Different types of cigarettes have been analysed with respect to their delivery of formaldehyde. Values found range from 40 to 90 micrograms per cigarette. The concentrations found in whole smoke are significantly higher than the values cited in the literature for gas phase formaldehyde. (Auth. Abs. Mod.)

71-1130. Suzuki, K., Horiguchi, T., Comas-Urrutia, A. C., Mueller-Heubach, E., Morishima, H. O., Adamsons, K. **Pharmacologic Effects of Nicotine Upon the Fetus and Mother in the Rhesus Monkey.** *American Journal of Obstetrics and Gynecology* 111(8):1092-1101, December 15, 1971.

The short-term pharmacologic effects of nicotine upon the cardiovascular performance, acid-base status, and oxygenation of the mother and fetus were investigated in 43 rhesus monkeys in the second half of gestation. Nicotine given intravenously to the mother in either a single dose of 1 mg/kg or a constant infusion at a rate of 100 micrograms/kg/min elicited bradycardia and hypertension which was followed by persistent hypotension. The fetus responded with hypotension and bradycardia (single injection) or tachycardia (constant infusion). Direct intravenous injection of nicotine into the fetus in a single dose of 0.9 to 2.5 mg/kg produced changes similar to those seen in the mother but quite different from those which occurred in the fetus when nicotine was given to the mother. The cardiovascular responses were more pronounced in the mature fetuses than in the less mature ones, indicating that sensitivity to nicotine is related to the development of the autonomic nervous system. Hypoxia and acidosis of the metabolic and respiratory type developed in the more mature fetus following administration of nicotine to the mother while the less mature fetus showed no significant changes in its acid-base status. The adverse effects of nicotine on the fetus following its administration to the mother seem to be due to the combined effects of impaired placental perfusion and a direct action of the transmitted nicotine upon the cardiovascular system of the fetus. (Auth. Abs.)

71-1131. Westfall, T. C., Brase, D. A. **Studies on the Mechanism of Tolerance to Nicotine-Induced Elevations of Urinary Catecholamines.** *Biochemical Pharmacology* 20(7):1627-1635, July 1971.

The mechanism of the return to normal of the elevated urinary catecholamines observed after the chronic administration of nicotine has been investigated. Three possible mechanisms leading to this phenomena were explored: (1) that continual nicotine exposure leads to an induction of enzyme activity resulting in an increased metabolism of the alkaloid, (2) that nicotine exposure results in some alterations in the storage or release of catecholamines, and (3) that some alteration in the inactivation of the amines occurred. The data indicate that after chronic nicotine (1 mg/kg, subcutaneous, twice daily up through 14 days), (1) there was no increase in the metabolism of nicotine itself determined from measurements of nicotine oxidase activity, (2) there was no alteration in the endogenous tissue levels of catecholamines determined by fluorometric analysis, (3) there was no alteration in the tissue uptake of (^3H)norepinephrine, and, as previously reported, (4) no alteration in the turnover of norepinephrine determined by measuring the decline of (^3H)norepinephrine in the heart following intravenous administration. On the other hand, there was a significant increase in the monoamine oxidase activity of the heart and liver and an increase in the catechol-*o*-methyl transferase activity of the liver. It is concluded that tolerance to nicotine induced elevations of urinary catecholamines is due to increased metabolic enzyme activity resulting in faster metabolism of the catecholamines released from the adrenal medulla and adrenergic nerve terminals. (Auth. Abs.)

71-1132. Zielhuis, R. L. **Luchtverontreiniging, Roken en Geneesmiddelen. [Air Pollution, Smoking and Medicine.]** *Tijdschrift voor Sociale Geneeskunde* 49(20):704, October 8, 1971, Dutch.

One result of smoking (voluntary pollution) and exposure to air pollution (compulsory pollution) may be an enzymatic induction which can accelerate the velocity of degradation of administered medicaments, thus requiring greater quantities of the medicaments. This hypotheses has been tested by the administration of pentazocine during nitrous oxide narcosis with a fixed amount of nitrous oxide until complete relaxation is achieved. The quantity of pentazocine was then determined in relation to residential location and smoking habits of the anesthetized subjects: 11 of 15 smokers required an above-average quantity of pentazocine as compared with only 7 of 26 nonsmokers; 13 of 20 urban dwellers required above-average amounts as compared with only 5 of 21 rural inhabitants; 9 of 10 urban smokers required above-average amounts as compared with 6 of 16 urban nonsmokers and only 3 of 15 rural nonsmokers. These differences were statistically significant.

See also, **71-1142, 71-1145, 71-1146, 71-1149, 71-1151, 71-1153, 71-1169, 71-1189, 71-1269, 71-1270**

MORTALITY AND MORBIDITY

71-1133. Fingerland, A., Husak, T., Bendlova, J. **Contribution to the Investigation of the Effect of Cigarette Smoking.** *Sbornik Vedeckych Praci Lekarske Fakulty Karlovy University v Hradci Kralove* 14(2):221-234, 1971.

During the years 1965 and 1966, 1,338 adults (765 males and 573 females) were autopsied. Of 662 autopsied adult males for whom smoking data were established, 517 (63 percent) were smokers and 145 (37 percent) were nonsmokers. Of the 431 women studied for whom a smoking history was established 26 (6 percent) were smokers and 405 (94 percent) were nonsmokers. The study focused on the relationship between smoking and the following seven diseases as diagnosed at autopsy: lung cancer, chronic bronchitis, pulmonary emphysema, silicosis of the lung, generalized arteriosclerosis, myocardial infarction, and peptic ulceration of the stomach and duodenum. Results indicated for all seven conditions approximately the same frequency in male and female nonsmokers, a fact which infers that differences in morbidity and mortality rates are related less to sex than to external influences, especially cigarette smoking. The frequency of lung cancer is 8 to 15 times higher in smokers than in nonsmokers and the frequency of lung cancer proportionally increases with the amount of cigarettes smoked. It is 25 times higher in males that have smoked over 500,000 cigarettes than in nonsmokers. The frequency of chronic bronchitis and emphysema is 2 to 3 times higher in smokers than in nonsmokers. The frequency of arteriosclerosis and myocardial infarction is about 50–60 percent higher in smokers than in nonsmokers. The frequency of peptic ulceration is 3 to 6 times higher in smokers than in nonsmokers.

71-1134. Royal College of Physicians of London. **Smoking and Health Now. A New Report and Summary on Smoking and Its Effects on Health From the Royal College of Physicians of London.** London, Pitman Medical and Scientific Publishing Company, 1971, 148 pp.

This second report on smoking by the Royal College of Physicians reviews the evidence of the effects of smoking on health and makes proposals for the prevention of diseases due to smoking. Topics covered include smoking and its relationship to illness and shortening of life, lung cancer, chronic bronchitis, emphysema, cardiovascular diseases, and other conditions. Suggestions for the prevention of smoking-related diseases include the identification of risk groups, the need for altering smokers' attitudes, the importance of the doctor's role, control of cigarette advertising, health education in schools, banning of smoking in public places, health warnings on cigarette packages, more smoking control clinics, statutory limits on nicotine and tar contents of cigarettes, and differential taxation on tobacco products.

See also, **71-1188, 71-1193, 71-1237**

NEOPLASTIC DISEASES

71-1135. British Medical Journal. **Occupational Cancer of the Lung and Smoking.** *British Medical Journal* 2(5705):313, May 9, 1970.

There appears to be an association between cigarette smoking habits and the incidence of lung cancer in various occupations, including workers in gold mines rich in arsenopyrite and asbestos workers. The latter have a risk of developing and dying of lung cancer that is 90 times that of nonsmokers not exposed to asbestos. Evidence suggests that the risk may be substantially reduced in asbestos workers if they do not smoke. Smoking may enhance the action of the inhaled respiratory carcinogens that are present in such occupations, perhaps by delaying their elimination through paralysis of ciliary action.

71-1136. Cherry, C. P., Glucksmann, A. **The Influence of Carcinogenic Dosage and of Sex on the Induction of Epitheliomas and Sarcomas in the Dorsal Skin of Rats.** *British Journal of Cancer* 25(3):544-564, September 1971.

The effect of varying the numbers (4, 5, 10, 20, and 40) of weekly applications of 9,10-dimethyl-1,2,-benzanthracene (DMBA) to the dorsal skin of intact and castraté male and female rats on the induction of basal and squamous celled epitheliomas and of sarcomas has been investigated. Basal-celled tumors originate mainly in hair follicles and squamous-celled neoplasms in the interfollicular regions of the epidermis and differ in their progression to malignancy. Penetration of the panniculus carnosus is neither a sufficient nor necessary criterion of malignancy since growing hair follicles pass through the muscle layer and carcinomas and sarcomas, which are still confined to the dermis, spread along the perineural lymphatics and metastasize to the lungs. Sex and castration do not affect carcinogenesis of epitheliomas in the dorsal skin at any dose level. Significantly more sarcomas result from 20 weekly paintings in male than in female or castrate rats. The induction period for all tumor types is shortened in sensitive individuals only by an increase from 5 to 10 weekly applications. For less sensitive animals the rate of oncogenesis is accelerated with number of administrations up to 20, but slowed down from this level by 40 paintings. The optimal dose for speed of induction of all tumor types, for maximal yield of basal celled epitheliomas, and for that of sarcomas in male rats is 20 weekly applications. The progression to malignancy varies with tumor type: it is fast for sarcomas and slow for basal-celled neoplasms. Of the 336 rats at risk only 1 percent have fibromas or other precursor lesions, while 40 percent have sarcomas; animals with squamous-celled papillomas account for 12 percent, but those with carcinomas for 66 percent; there are, however, 64 percent of rats with basal-celled papillomas and only 9 percent with carcinomas. The optimal dose phenomenon in carcinogenesis is discussed. (Auth. Abs.)

71-1137. Ederer, F., Leren, P., Turpeinen, O., Frantz, I. D. (Jr.) **Cancer Among Men on Cholesterol-Lowering Diets. Experience From Five Clinical Trials.** *Lancet* 2(7717):203-206, July 24, 1971.

A comparison of the cancer experience in clinical trials of serum-cholesterol-lowering diets in Oslo, London, Helsinki, and Faribault (Minnesota) with that reported in a trial at a Los Angeles veterans' institution revealed that one of the four studies accorded with the Los Angeles findings of increased cancer incidence and mortality while the remaining three had opposite results. For four studies combined (excluding Los Angeles), the estimated risk of cancer development in the experimental group relative to that in the control group was 0.75, and the relative risk becomes 1.15 for cancer incidence and 1.08 for cancer death. None of the relative risks are significantly different from unity, so that the combined results of the five studies are consistent with the hypothesis that the cholesterol-lowering diets do not influence cancer risk. Age and cigarette smoking were compared between the experimental and control groups in the London, Los Angeles, and Oslo studies and when they were included as covariables in calculating relative risk of death and chi-square by the Mantel-Haenzel method, it did not appreciably affect the results. The Helsinki series was also closely matched for age and smoking. Cigarette smoking, but not age, was used as a stratifying factor in randomising the Faribault men. More data are needed to determine whether serum-cholesterol-lowering diets increase, decrease, or leave unaltered the cancer risk. Combined data from the five studies show that deaths from all causes were lower, though not significantly so, in the experimental groups than in the control groups.

71-1138. Ferrara, F. A. **Ecological Analysis of Lung Cancer in the City of La Plata.** In: Englund, H. M., Beery, W. T. (Editors). Proceedings of the Second International Clear Air Congress. Air Pollution Control Association. New York, Academic Press. 1971, pp. 244-247.

A study was conducted to determine the influence of the smoking habit among patients with cancer of the lung, larynx, and bladder in La Plata, Argentina. The results demonstrated a highly significant association between these diseases and the smoking habit. The significance of an "urban factor" in the etiology of these pathologies was also shown which, in the specific case of La Plata, led to the assumption that there are additional significant etiological factors.

71-1139. Garbe, E. **Tabac et Cancer. Problemes Epidemiologiques. [Tobacco and Cancer. Epidemiological Problems.]** *Vie Medicale* 52(30):3453, 3454, 3457-3460, 3462, October 1971, French.

Epidemiological investigations have established that life expectancy of male smokers is three to five years lower than that of nonsmokers and that this reduction in life expectancy reaches eight years for those smoking two packs of cigarettes per day. The epidemiological data indicate a link between the number of cigarettes smoked and the general mortality and certain diseases such as myocardial infarct and lung cancer The present report deals with the place of tobacco in the etiology of certain cancer localizations as reported in major epidemiological investigations. The studies include a French investigation on 3937 cancer patients, first reported in 1960. The author also discusses the manner in which epidemiological investigations on tobacco should be conducted for valid results. Multivariate analysis, and one of its variants, "cluster analysis" may reveal environmental factors in certain diseases which are susceptible to elimination.

71-1140. Gsell, O. R. **Epidemiology of Bronchial Carcinoma in a Mountain Region.** *Oncology* 25(5):410-414, 1971.

An analysis of 102 lung cancers in men in a Swiss alpine district showed that of the 100 smokers, 96 percent were heavy smokers. Approximately 22 percent were pure cigarette smokers, 60 percent were cigar or pipe smokers, and 18 percent were mixed cigar and cigarette smokers. The average age of death due to lung cancer in these men was 58 years in cigarette smokers and 66 years in pipe and cigar smokers. This suggests that in cigarette smokers, the carcinogens reach the lower respiratory tract in greater quantities than in cigar smokers and that this is the reason for an earlier lung cancer death for cigarette smokers. These results also indicate that cigar smokers have a lung cancer risk, especially when cigars are smoked for many years and in a large daily quantity.

71-1141. Guira, A. C. **Bladder Carcinoma in Rubber Workers.** *Journal of Urology* 106(4):548-552, October 1971.

A study was begun on the incidence of bladder cancer among rubber workers and an attempt is being made to discover possible carcinogens used in the rubber industry. Various facts concerning working conditions, type and grade of tumor, smoking habits, and family history are being gathered. The incidence of bladder cancer appears to be significantly higher among rubber workers. The history of industrial carcinogens has been reviewed and its bearing on this study has been shown. Presently, the epidemiological portion of the study is in progress.

71-1142. Homburger, F. **Mechanical Irritation, Polycyclic Hydrocarbons, and Snuff. Effects on Facial Skin, Cheek Pouch, and Oral Mucosa in Syrian Hamsters.** *Archives of Pathology* 91:411-417, May 1971.

Syrian golden hamsters (BIO RB strain) were subjected five days of each week for up to one year to immobilization in a stanchion by means of a collar and insertion of a bit containing either cotton or cotton impregnated with benzo(*a*)pyrene, 9,10-dimethyl-1,2-benzanthracene (DMBA), or snuff (a form of pulverized tobacco) into the gingivolingual fold. While the polycyclic hydrocarbons, especially DMBA, caused a few carcinomas of the oral mucosa and a much higher number of perioral skin cancers, the exposure to tobacco caused no changes more intense than those seen in animals biting on cotton-containing bits. Skin responded to known carcinogens more readily than oral mucosa and, thus, is the best test object for this kind of contact carcinogenesis. (Auth. Abs.)

71-1143. Hoover, R., Cole, P. **Population Trends in Cigarette Smoking and Bladder Cancer.** *American Journal of Epidemiology* 94(5):409-418, November 1971.

An association between cigarette smoking and bladder cancer has frequently been demonstrated. The causal nature of the association has, however, remained in doubt. Because of this, trends in smoking habits and bladder cancer experience were examined for successive birth cohorts of men and women in the United States, Denmark, England, and Wales. Increasing rates of the disease were observed in populations characterized by an increase in smoking among successive birth cohorts. The association is consistent in both sexes, different nationalities, and in urban and rural groups. This makes it unlikely that the findings result from an association both of smoking and bladder cancer with a third variable.

71-1144. Hueper, W. C. **Public Health Hazards From Environmental Chemical Carcinogens, Mutagens and Teratogens.** *Health Physics* 21(5):689-707, November 1971.

Environmental chemical cancer hazards, together with radiation cancer hazards, form the principal segments of the human environmental spectrum of carcinogenic risks. The cancer hazards from both types of carcinogenic agents have been rising during the past 75 years because of the growing contamination of the human environment with products and wastes of modern industry. This development is responsible for the moderate to marked increases in frequency of certain cancers in many industrialized countries and for the shifts in age and sex distribution of certain cancers in general or circumscribed population groups. Since carcinogenic effects on cells are largely irreversible and thus persistent and cumulative when repeated, exposure to even small doses of carcinogens sustained over long periods in a carcinogenically polluted environment create definite cancer risks. The concept of a "safe" dose for carcinogens is without scientific basis, is deceptive and, if legally adopted, represents a potentially highly dangerous public health policy. While protecting special economic and professional interests, its application tends to raise gradually and insidiously the level of carcinogenic contamination of the human environment. Moreover there does not exist a reliable method or procedure for determining and defining a "safe" dose. All avoidable environmental carcinogens therefore should be eliminated and prevented from entering the human environment. All unavoidable carcinogenic risks should be reduced to the lowest possible minimum and the exposed individuals should be kept under life-long medical surveillance for the detection of precancerous and early cancerous lesions which might result from such contacts. Since many carcinogens are also mutagens and teratogens, such a policy would protect the population against many of these hazards likewise associated with the growing chemicalization of the human environment with man-made and often avoidable dangerous products and wastes. Since close and extensive similarities exist between the biologic characteristics of chemical carcinogens mutagens and teratogens with those displayed by carcinogenic radiations the principles and criteria found useful and valid in the identification and control of chemical cancer risks are applicable also for the preventive management of radiation cancer hazards. (Auth. Abs.)

71-1145. Inui, N., Takayama, S. **Acceleration of Proliferation and Tumor Production Rate of L-Strain Cells by Treatment With Cigarette Tar.** *Gann* 62(4):315-320, August 1971.

L-strain cells were treated with cigarette tar for 3 hr. The cells treated with 25 (LT-25) or 100 (LT-100) micrograms/ml of tar showed enlarged and vacuolated cytoplasms, and giant cells were found immediately after the treatment. Cells treated with 250 or 500 micrograms/ml of tar died within 24 hr after the treatment. Cells of LT-100 and LT-25 showed a remarkable growth 50 or 60 days after the treatment as compared with control cells. Plating efficiency was also different in treated and nontreated cells. About 70 days after the treatment, 10^5 to 10^6 cells from the treated and control cells were injected into the newborn C3H mice. Tumor formation was observed in animals injected with LT-100 and LT-25 cells, but not in animals inoculated with LA-100 (ethanol-treated cells), or non-treated cells except in only one case. Some numerical changes in chromosome number were observed but no cytomorphological changes occurred in the treated cells. (Auth. Abs.)

71-1146. Inui, N., Takayama, S. **Effect of Cigarette Tar Upon Tissue Culture Cells. Neoplastic Transformation of Hamster Lung Cells by Tobacco Tar in Tissue Culture.** *British Journal of Cancer* 25(3):574-583, September 1971.

Hamster lung fibroblastic cells were transformed into malignant cells in vitro by exposure to crude cigarette tar for 3 hours. Primary injuries of cells were observed between 2 and 48 hours after the treatment. Tar-treated cells showed nuclear pyknosis, cell necrosis, and enlarged, vacuolated cytoplasm. In one case giant cells were found at about 48 hours after treatment. Transformation occurred over 100 days after the treatment. The characteristics of transformed cells were random orientation of cells, with piling-up and crisscrossing, and continuous growth in vitro for over 300 days. Plating efficiency with treated cells was different from untreated cells. The transformed cells, cultured for 100 to 160 days, produced tumors when transplanted in cheek pouch of hamsters. Five of nine animals inoculated with 100 micrograms/ml of tar treated cells (HT-100 strains) over 160 days in vitro died from tumors. The others were killed for histological examinations and one of the five animals was transplanted with the cells of HT-10 strains within 121 days after the tar treatment. Histologically, the tumors were pleomorphic fibrosarcomas. Low doses (1×10^5 or less) of control cells failed to produce tumors after 270 days in culture. Contrarily, higher doses of 10^7 of control cells produced tumors when injected into the animals after 270 days in culture. (Auth. Abs.)

71-1147. Ivakhno, G. I. **O Roli Kureniya v Zabolevayemosti Rakom Legkogo. [Role of Smoking in the Incidence of Lung Cancer.]** *Vrachebnoe Delo* 9:99-101, 1971, Russian.

The smoking habits of 1600 male lung cancer patients in the Ukraine have been analyzed statistically. Two types of controls were utilized in the study, (1) 1600 healthy persons and (2) 1200 cancer patients other than lung cancer cases. The incidence of lung cancer was found to be greatest in the smoker group. The incidence was also greater for heavy smokers, those beginning the habit earlier and smoking for a longer period of time, and those smoking a variety of tobacco products. Smoking on an empty stomach also had a similar adverse effect. A preliminary study on the relationship between lung cancer and the consumption of tobacco in the Ukraine also demonstrated that smoking is an important etiological factor in the development of lung cancer.

71-1148. Nettesheim P., Hanna, M. G. (Jr.), Deatherage, J. W. (Jr.) (Editors) **Morphology of Experimental Respiratory Carcinogenesis.** Proceedings of a Biology Division, Oak Ridge National Laboratory conference, Gatlinburg, Tennessee, May 13-16, 1970. U.S. Atomic Energy Commission, Division of Technical Information, Oak Ridge, Tennessee, AEC Symposium Series 21, December 1970, 483 pp.

The primary purpose of this conference was to evaluate critically the adequacy of the available experimental models for studying the multifactorial etiology of lung cancer. The methodologies, experimental designs, and biological end points used in these studies are reviewed. These proceedings deal specifically with the morphological characteristics of tumors in the respiratory tract of common laboratory and domestic animals, and their induction by various carcinogens and methods of exposure. Session I reviews the cellular elements of the lung, their morphological characteristics, and their proliferative and differentiative potential. Session II deals with the morphogenesis, classification, and epidemiology of human lung tumors. The necessary background is provided on the human disease with which all experimental attempts have to be matched and experimentation is put into its proper perspective. Sessions III and IV survey the various animal models now available for the study of respiratory carcinogenesis. Various species are compared in terms of their lung tumor response to different carcinogens. administered by different routes and at different dose levels. An extensive morphological description is made of the most common "spontaneous" and experimentally induced respiratory tract tumors in various domestic and laboratory animals. The most recent advances in the field of respiratory carcinogenesis. including the successful induction of bronchogenic carcinoma in primates by administration of polycyclic hydrocarbons, are described in Session V. The development of a unified lung tumor classification which is applicable to the most important laboratory animal species is discussed in Session VI along with two tentative proposals for classifying respiratory tract neoplasms.

71-1149. Radomski, J. L., Brill, E. **The Role of N-Oxidation Products of Aromatic Amines in the Induction of Bladder Cancer in the Dog.** *Archiv fur Toxikologie* 28(3):159-175, November 25, 1971.

Highly sensitive gas chromatographic methods for the determination of the N-hydroxy and nitroso derivatives of 1- and 2-naphthylamine, and 4-aminobiphenyl in urine have been developed. Dogs given a single oral 70 mg/kg dose of 1-naphthylamine were found to excrete almost as much of these N-oxidation products as dogs given the same dose of 2-naphthylamine. However, when 5 mg/kg of 2-naphthylamine was given, a total of approximately 0.2 percent of the administered dose was found in the urine as N-oxidation products, while the same dose of 1-naphthylamine produced only faint traces. The N-oxidation products present were 2-naphthylhydroxylamine and 2-nitrosonaphthalene. In addition, blood methemoglobin production, a measure of the level of N-hydroxylation occurring, observed with 2-naphthylamine was much greater than with 1-naphthylamine at the 70 mg/kg dose. 4-Aminobiphenyl, the most potent carcinogen, produced even higher levels of N-oxidation products in the urine and blood methemoglobin than 2-naphthylamine. These results indicate that N-oxidation may be a key process in the production of bladder cancer by 2-naphthylamine and 4 aminobiphenyl. (Auth. Abs.)

71-1150. Reddy, C.R.R.M., Kameswari, V. R., Ramulu C., Reddy, P. G. **Histopathological Study of Stomatitis Nicotina.** *British Journal of Cancer* 25(3):403-410. September 1971.

One hundred and thirteen biopsies of the palate in people accustomed to smoking cigars, most of them with the burning end of the cigar inside the mouth, have been studied. Thirty-eight of these showed mild to severe atypical changes in the epithelium. There were 19 lesions showing orthokeratosis and 53 showing hyperorthokeratosis. The earliest atypical change is seen in the mouths of the ducts of the glands. There were three cases showing microinvasive carcinomas. Pigmentation is a prominent feature in these cases. The papules with umbilication could be due to hyperplasia of the mucous glands. It is suggested that stomatitis nicotina occurring in men and women with the habit of reverse smoking is probably precancerous because of the presence of atypical changes in the epithelium and also the finding of three microinvasive carcinomas without any macroscopic evidence. There is no acceptable explanation why the soft palate escapes getting either stomatitis nicotina lesion or carcinoma in reverse smokers. (Auth. Abs.)

71-1151. Shabad, L. M. **Dose-Response Studies in Experimentally Induced Lung Tumours.** *Environmental Research* 4(4):305-315, October 1971.

The number of mouse lung adenomas induced by urethane is dose-dependent. This is true both for newborn mice and adult mice and also under conditions of transplacental transmission. The existence of a dose-response effect has also been shown for adenomas induced in embryonic lung tissue organ cultures by the injection of urethane into pregnant mice. The establishment of an experimental model of human lung cancer by intratracheal instillation of carcinogenic compounds into rats made possible a systematic study of dose-response effects in the induction of experimental bronchogenic carcinomas and precancerous lesions using benzo(*a*)pyrene, 1,2,5,6-dibenzanthracene, and 7,12-dimethyl-benz(*a*)anthracene. A decrease in the amount of carcinogen always resulted in a decrease in the induction rate of malignant tumors and precancerous lesions. Repeated injections stimulated the blastomogenic effect. "Borderline" doses did not induce cancer but precancerous lesions were found. "Noncarcinogenic" doses can be determined for each experiment and each carcinogen. The problem of maximum permissible dose or concentration of carcinogenic substances has been discussed but there is some difference of opinion on this question. Nevertheless, the regular experimental finding of a dose-response effect can serve as a basis for cancer prevention. (Auth. Abs. Mod.)

71-1152. Silverman, S. (Jr.), Galante, M. **Oral Cancer.** University of California, San Francisco Medical Center, 1970, 56 pp.

This monograph deals with the entire problem of oral cancer control: 1) epidemiology; 2) etiology; 3) premalignant factors and prevention; 4) diagnosis; 5) treatment; 6) rehabilitation; and 7) survival. The use of tobacco in all forms—cigarettes, cigars, pipes, chewing, and snuff—increases the risk for eventually developing oral carcinoma and appears to be related causally. This is based on the following facts: 1) carcinogenic agents have been isolated from tobacco condensates; 2) tobacco can induce cellular change and tissue atypia; 3) there is increased use of tobacco among patients with oral carcinoma when compared with control groups; 4) tobacco used in various forms has been associated with an unusually high prevalence of carcinoma of specific oral sites; 5) continued smoking appears to be a factor in the development of multiple oral carcinomas; and 6) there is an increased mortality ratio from oral cancer when comparing smokers with nonsmokers.

71-1153. Takahashi, T., Yanagisawa, T., Majima, S. **Induction of Carcinoma of Glandular Stomach in Rats by Local Application of 7,12-Dimethylbenz(*a*)anthracene.** *Gann* 62(4):259-265, August 1971.

After a long-term observation of the local application of 7,12-dimethylbenz(*a*)-anthracene (DMBA) to the mucosa of the glandular stomach of rats, 11 of 46 rats exhibited carcinoma at the site of application of the carcinogen. Microscopically nine were adenocarcinoma and two were anaplastic growth patterns consisting of epithelial-like cells originating either in glandular epithelium or in non-epithelial cells. Two of the animals with carcinoma had hemorrhagic ascites containing tumor cells. One of these showed an ascites tumor in a pure culture state of tumor cells. Autoradiographic studies using ^{3}H-thymidine revealed that the regenerating epithelium at the margin of the ulcer, which was induced by DMBA treatment, showed the highest DNA synthesis and that the heterotopic epithelium without cytological atypism almost failed to synthesize DNA. Transplantation of six nodules induced by DMBA was attempted and one carcinoma was successfully transplanted up to the second generation. (Auth. Abs.)

71-1154. Xipell, J. M. **The Incidence of Benign Renal Nodules. (A Clinicopathologic Study).** *Journal of Urology* 106(4):503-506, October 1971.

The incidence and histological features of renal nodules in a series of 250 necropsies were studied. Adenomas were found in 22.4 percent of cases medullary fibrous nodules in 26.8 percent miscellaneous cortical mesenchymal nodules in 8.4 percent and adrenal rests in 4.4 percent. The findings were further analysed in relation to renal vascular disease and scarring, smoking, and alcohol consumption. A statistically significant association between adenomas and smoking was demonstrated. (Auth. Abs.)

See also, **71-1127, 71-1133, 71-1134, 71-1188, 71-1237**

NON-NEOPLASTIC RESPIRATORY DISEASES

71-1155. Auerbach, O., Hammond, E. C., Garfinkel, L. **Epithelial Changes in Ex-Cigarette Smokers.** *Cancer Cytology* 11(1):5-12, 1971.

This study was undertaken to determine whether there is any difference in the changes in the bronchial epithelium between ex-cigarette smokers and men who had continued to smoke. The study of ex-smokers was part of a large study of changes in the bronchial epithelium of 758 subjects (456 men and 302 women) who had died of cancers other than lung cancer. Regardless of age or sex, very few cells with atypical nuclei were found in the bronchial epithelium of persons who had never smoked and had never been occupationally exposed to certain dusts or vapors. Many cells with atypical nuclei were found in the bronchial epithelium of most cigarette smokers, and the number of such cells increased markedly with the amount of cigarette smoking. Among men who smoked cigarettes regularly up to the time of their terminal illness, the number of cells with atypical nuclei increased with age, that is, with years of exposure to cigarette smoke. Upon cessation of smoking the number of cells with atypical nuclei diminished and many years after cessation of smoking few of these cells were found in the bronchial epithelium. Cells with disintegrating nuclei were found in the bronchial epithelium of the ex-smokers, but such cells were not present in the bronchial epithelium of smokers and nonsmokers. Originally these may have been cells with atypical nuclei but there is not enough evidence to justify this claim.

71-1156. Bowden, D. H. **The Alveolar Macrophage.** *Current Topics in Pathology* 55:1-36, 1971.

The interrelationships of the structure and function of alveolar macrophages, the intrinisic and extrinsic factors which modify macrophage function, and the influence of these changes on pulmonary homeostasis and the development of pathological changes in the lung are reviewed. The dominant role of the macrophage in pulmonary defense against infection, the variety of agents that injure this cell, and the remarkable proliferative capacity of its precursors explain the broad spectrum of pulmonary diseases characterized by a macrophagic response. The macrophage response to cigarette smoke is of interest because of the suspected relationship between heavy smoking and chronic bronchitis. Alveolar macrophages from the sputum of smokers contain a pale brown sudanophilic pigment which is fluorescent. Accumulation of this lipoprotein is accompanied by a decrease in oxidative metabolism which may impair phagocytic activity. Fresh cigarette smoke depresses the bactericidal activity of alveolar macrophages. This effect is blocked by glutathione or cysteine in culture which suggests that smoke toxicity may result from peroxidation of lipid components in the cell membrane. One investigator found that cigarette smoke does not inhibit bactericidal activity but reduces the overall clearance of bacteria by impairing mucociliary transport from the lung.

71-1157. Chyrek-Borowska, S., Karna, T., Zietkowski, B., Zakowska, J. **Czestosc Wystepowania Uczulen na Tyton u Chorych na Dychawice Oskrzelowa. [Incidence of Tobacco Allergy in Patients With Bronchial Asthma.]** *Polski Tygodnik Lekarski* 26(49):1902 1905, December 6, 1971, Polish.

The harmful effects of tobacco and tobacco smoke on the clinical course of allergic bronchial asthma were analyzed in 1000 patients. It has been shown that independently of active smoking about 30 percent of patients regarded their clinical manifestations as connected with exposure to tobacco smoke. Skin tests with tobacco allergen carried out in 304 patients confirmed the allergic character of immediate type reactions. The frequency of positive skin tests was demonstrated to be twice as high in allergic patients than in healthy subjects. The possible biochemical and immunologic mechanisms of tobacco allergy are discussed.

71-1158. Da Costa, J. L., Tock, E.P.C., Boey, H. K. **Lung Disease With Chronic Obstruction in Opium Smokers in Singapore. Clinical, Electrocardiographic, Radiological, Functional, and Pathological Features.** *Thorax* 26(5):555-571, September 1971.

Fifty-four opium smokers with chronic obstructive lung disease were studied for two-and-a-half years. Forty-eight patients had a cough for at least two years before the onset of inappropriate exertional dyspnea. Fine, bubbling adventitious sounds suggesting small airway disease were heard on auscultation over the middle and lower lobes in 38 patients. The prevalence of inflammatory lung disease and chronic respiratory failure in this series is suggesed as the main cause for the frequent finding of right ventricular hypertrophy and congestive heart failure. Physiological studies revealed moderate to severe airways obstruction with gross over-inflation and, in 32 patients, an additional restrictive defect probably due to peribronchiolar fibrosis. Radiological evidence of chronic bronchitis and bronchiolitis was observed in 45 patients, 'pure' chronic bronchiolitis in 6 patients, and 'widespread' emphysema in 25 patients respectively. Necropsy examinations in nine patients, however showed destructive emphysema of variable severity in all. Chronic bronchiolitis often associated with striking bronchiolectasis was present in six cases. More severe bronchiolar rather than bronchial inflammation was noted. The heavy opium smokers had characteristic nodular shadows on chest radiography, sometimes associated with a striking reticular pattern not seen in 'pure' cigarette smokers. This was due to gross pigmented dust (presumably carbon) deposition in relation to blood vessels, lymphatics, and bronchioles, and also within the alveoli. It is speculated that the initial lesion is an acquired bronchiolitis. Opium smoking induces an irritative bronchopathy favoring repeated attacks of acute bronchiolitis and eventually resulting in obliterative bronchiolitis, peribronchiolar fibrosis, chronic bronchitis, and destructive emphysema. (Auth. Abs.)

71-1159. Dobisova, M., Trnka, L., Fiser, F., Tomanek, A. **Abhangigkeit der mikrobiellen Flora im Bronchialbaum von der Bronchialsekretion und den Hustensymptomen bei chronisch Lungenkranken. [Dependence of the Bronchial Secretion and Cough Symptoms on the**

Microbial Flora in the Bronchial Tree of Chronic Lung Disease Patients.] *Praxis der Pneumologie* 25(5):249-254, May 1971, German.

In a prospective study of 255 bronchoscopic patients with chronic lung diseases, a correlation could be shown between duration and intensity of cough symptoms and endobronchial secretion. However, no connection could be discovered between subjective complaints and the presence and composition of microbial flora in the bronchial tree. The lack of correlation occurred in patients having the typical bronchial syndrome where no acute exacerbations were present. Analysis of the smoking habits of the patients showed that 84.6 percent of those with chronic cough were smokers, as were 70.7 percent of those with sub-acute cough. Only 58.3 percent of the controls were smokers. The possible significance of secondary bacterial invasion as well as the chemical and antibiotic pretreatment are discussed. The results demonstrate the limitation on the possible uses of microbiological routine examinations in patients with chronic lung diseases.

71-1160. Dowell, A. R., Kilburn, K. H., Pratt, P. C. **Short-Term Exposure to Nitrogen Dioxide. Effect on Pulmonary Ultrastructure, Compliance, and the Surfactant System.** *Archives of Internal Medicine* 128(1):74-80, July 1971.

Eleven beagles were exposed to nitrogen dioxide in concentrations ranging from 3 to 16 ppm for one hour. Two control dogs were air-ventilated for one hour. Widespread bleb formation, loss of pinocytotic vesicles, and mitochondrial swelling of endothelial cells ensued. Intraalveolar edema occurred in most dogs exposed to 7 ppm nitrogen dioxide or higher and membrane damage without edema occurred in the others. Intraalveolar edema by light microscopy was associated with impaired surfactant activity and lung compliance. Exposure to nitrogen dioxide of 5 ppm or greater resulted in decrease of recovered lung lavage saturated lecithin. Exposure to 3 ppm nitrogen dioxide resulted in bleb formation in alveolar endothelium without biochemical or physiological changes. (Auth. Abs.)

71-1161. Ferris, B. G. (Jr.), Higgins, I.T.T., Higgins, M. W., Peters, J. M., Van Ganse, W. F., Goldman, M. D. **Chronic Nonspecific Respiratory Disease, Berlin, New Hampshire, 1961-1967: A Cross-Sectional Study.** *American Review of Respiratory Disease* 104(2):232-244, August 1971.

A repeat study of a sample of the population of Berlin, New Hampshire in 1967 showed slightly lower disease prevalences than in 1961 after standardization for age, sex, and smoking habits. Results of some of the pulmonary function tests were slightly better in 1967. Levels of air pollution were less in 1967. It is believed that the decrease in air pollution could account for the decreased prevalence of disease and the slight improvement in pulmonary function. (Auth. Abs.)

71-1162. Graczyk, J., Bukalska, Z. **Przewlekle Zapalenie Oskrzeli i Ocena Wydolnosci Oddechowej u Ozdrowiencow z Gruzlicy. [Chronic Bronchitis and Assessment of Respiratory Function in Convalescents After Tuberculosis.]** *Gruzlica i Choroby Pluc* 39(7):610-615, July 1971, Polish.

One hundred men, aged from 40 to 65, convalescent after tuberculosis were examined by means of questionnaires, miniature films, and spirograms Manifestations of chronic bronchitis were found in 18 percent of them, and ventilatory disturbances in 48 percent. Ventilatory disturbances were more frequent in patients who had extensive residual lesions in the lungs and restricted movements of the diaphragm than in the remaining ones; complication with chronic bronchitis enhanced obstructive disturbances. The effect of smoking on the incidence of chronic bronchitis in convalescents after tuberculosis was shown. Among these patients, there was a greater percentage of cigarette smokers than of nonsmokers and ex-smokers, the percentage rising with the duration of the smoking habit. The patients with chronic bronchitis were, on the average, five years older than those without chronic bronchitis.

71-1163. Huttemann, U., Oswald, P., Lode, H., Huckauf, H. **Veranderungen der Lungenfunktion Jugendlicher als Folge langjahrigen Zigarettenrauchens. [Changes in Pulmonary Function of Young People as a Result of Cigarette Smoking Over Many Years.]** *Deutsche Medizinische Wochenschrift* 96(46):1791-1793, November 12, 1971, German.

Lung function studies (spirometry, bodyplethysmography and esophageal pressure through a balloon catheter) were performed on 20 young smokers and nonsmokers without heart or lung disease. Average age was 29 years. There was no difference in lung volumes or bronchial flow resistance between nonsmokers and smokers. Viscous work of breathing of nonsmokers averaged 3.58 p • cm/ml; those of smokers 5.17 p • cm/ml, a statistically significant increase. Static maximal retraction pressure of the lung was within normal limits in both groups. Static compliance of nonsmokers was 0.25 l/cm H_2O (within normal limits), while that of smokers at 0.39 l/cm H_2O, was significantly increased. Dynamic compliance of smokers showed a marked (statistically significant) rate dependence. The observed abnormalities in smokers are thought to be due to changes in the peripheral respiratory pathways. They correspond to the initial phase of chronic obstructive pulmonary disease. (Auth. Abs.)

71-1164. Jones, M. C., Thomas, G. O. **Alpha$_1$-Antitrypsin Deficiency and Pulmonary Emphysema.** *Thorax* 26(6):652-662, November 1971.

An association between a genetically determined deficiency of the serum enzyme alpha$_1$-antitrypsin and pulmonary emphysema is now well established. Serum antitryptic activity was measured in 103 patients suspected of having emphysema. Eighty-seven fulfilled the diagnostic criteria for emphysema and, of these, 16 had deficient levels, 5 had intermediate levels and 66 had normal levels. The results of clinical, radiographic, and physiological studies of each group were then compared. Characteristic features noted in the deficient group included onset of dyspnea during the third or fourth decades and uniformly symmetrical radiographic lower zone involvement. In the deficient group, the mean age at onset of dyspnea was 35.6 years, yet symptoms did not develop until the age of 49 years in the only nonsmoker in the group. Among non-deficient patients no such difference between smokers and nonsmokers was apparent. Other factors such as sex distribution and chronic bronchitis are discussed. Sixty-eight relatives of the 16 patients with deficient levels were also studied. The findings in these are compatible with an autosomal recessive mode of inheritance although difficulties in identifying the heterozygous state were encountered. Six relatives had deficient levels and three of these had emphysema.

71-1165. Khosla, T. **Indices of Ventilatory Measurements.** *British Journal of Preventive and Social Medicine* 25(4):203-209, November 1971.

Ventilatory measurements of about 8,000 steel workers at Ebbw Vale and over 10,000 at Port Talbot were recorded as part of the extensive bronchitis survey in the steel industry. Forced expiratory volume in one second (FEV_1), forced vital capacity (FVC), and FEV/FVC percent decrease with age and within age groups increase with height. Height itself decreases with age. Because of these interrelations the usual regression approach is complex. Three simple indices have therefore been derived from the Port Talbot study and have then been applied to the Ebbw Vale study to validate them. Although the two works populations are different, the indices are in good agreement. The calculation of indices requires minimal information on mean age, mean height, and mean values of FEV_1, FVC, and FEC percent to compare groups which are different by other criteria such as symptomatology grades, smoking habits, occupation, race, and diseased state. Results derived from multiple regression analysis and indices are shown to be very similar for the age range 30-55 years. (Auth. Abs. Mod.)

71-1166. Kilpatrick, G. S. **Advances in the Treatment of Respiratory Disorders.** *Practitioner* 207(1240):460-467, October 1971.

A brief review is made of advances in: the management of lung cancer and bronchitis; the search for mucolytic agents, respiratory stimulants, and influenza vaccines; and the treatment of related conditions (i.e. alpha-antitrypsin deficiency, the smoking habit, acute respiratory infections, respiratory tuberculosis, superinfection, and iatrogenic respiratory disease). Alpha-antitrypsin deficiency has been found in emphysematous patients, and smoking in these patients seems to hasten the onset of this type of emphysema. Despite the fact that many smokers want to quit, little progress has been made in treating the smoking habit. There has been no government action on a possible lower tax on a less harmful tobacco. Hypnotism has been found to have only a transient effect, drugs have failed, and so have smoking withdrawal clinics.

71-1167. Kueppers, F., Fallat, R., Larson, R. K. **Obstructive Lung Disease and Alpha$_1$-Antitrypsin Deficiency Gene Heterozygosity.** *Science* 165(3896):899-900, August 29, 1969.

The phenotypes of serum alpha$_1$-antitrypsin were determined by antigen-antibody crossed electrophoresis. There were 5 homozygotes and 25 heterozygotes for the deficiency gene found in a group of 103 patients with obstructive lung disease. There were 14 and 8 heterozygotes in two control groups with respective mean ages of 36 and 80. There was only one heterozygote among 39 healthy males over 70 years of age. Of the 8 heterozygotes in the older control group, only 2 were light cigarette smokers. Of the 25 heterozygotes with obstructive lung disease, only 2 were over 70 years of age, both were female and nonsmokers; all of the remaining 23 were cigarette smokers. The very low incidence of healthy male heterozygotes over the age of 70 might be explained by their selective predisposition to obstructive lung disease related to cigarette smoking.

71-1168. Lebrun-Brais, L., Blanchette, G., Provost G. **Emphyseme Pulmonaire par Deficience en Alpha-1 Antitrypsine: Une Etude Familiale. [Pulmonary Emphysema Caused by Alpha-1 Antitrypsin Deficiency: A Family Study.]** *Union Medicale du Canada* 100(10):1920-1934, October 1971, French.

A family of 12 persons is described in whom variable serum levels of alpha$_1$-antitrypsin were detected. Four of these patients also suffered from a familial type of pulmonary emphysema. In a double blind study the histories and clinical, physiological, and radiological findings of these patients were compared with those of an emphysematous control group. The particular features of familial emphysema associated with this type of protein deficiency are demonstrated. The various modes of genetic transmission for this disease are discussed, its pathogenic mechanisms are assessed, and suggestions are made as to its diagnosis, treatment, and prevention.

71-1169. Lewis, G. P., Lyle, H., Miller, S. **Association Between Elevated Hepatic Water-Soluble Protein-Bound Cadmium Levels and Chronic Bronchitis and/or Emphysema.** *Lancet* 2(7634):1330-1333, December 20, 1971.

The cadmium, copper, and iron levels in concentrated water-soluble protein extract prepared from 60 human liver specimens were estimated. Extracts from patients dying with mention of chronic bronchitis and/or emphysema were found to have a mean cadmium level greater than three times that found in the rest. Possible sources of cadmium intake in these cases included air pollution and cigarette smoking.

71-1170. Lieberman, J. **Heterozygous and Homozygous Alpha$_1$-Antitrypsin Deficiency in Patients With Pulmonary Emphysema.** *New England Journal of Medicine* 281(6):279-284, August 7, 1969.

Homozygous deficiency of alpha$_1$-antitrypsin is known to predispose to pulmonary emphysema. Measurement of the trypsin inhibitory capacity (TIC) of serum specimens from 28 relatives of a homozygous proband suggested that both heterozygotes and homozygotes may have an increased predisposition to lung disease and possible to peptic ulcer. Four of 19 heterozygotes and two homozygotes in this family had definite histories of pulmonary disease. After this family study, the TIC of serum was measured in 66 patients hospitalized for pulmonary emphysema at a Veterans Administration hospital. Of these, 25.8 percent were found to be deficient; 7 were homozygotes, and 10 heterozygotes. Of 23 patients with emphysema under 50 years of age, 48 percent were deficient. A history of peptic-ulcer disease was obtained from 35.3 percent of the antitrypsin-deficient, as compared to 28.6 percent of the non-deficient patients with emphysema, a difference statistically not significant. (Auth. Abs.)

71-1171. Martin, P., Kanarek, D., Zwi, S., Boyd, A. V., Koornhof, H. J. **The Incidence of Fungi in the Throat.** *Mycopathologia et Mycologia Applicata* 45(2):165-187, October 13, 1971.

A brief literature review on the incidence of fungi from various sites in the body is presented. Throat swabs were taken from 468 patients attending the Johannesburg General Hospital between March 1968 and February 1969. The fungi obtained comprised yeasts only and no filamentous species. The overall incidence of fungi was 44 percent, but various factors were shown to influence this. The main factors appeared to be age, chronic lung disease, seasonal fluctuations, use of drugs (particularly digoxin and antibiotics), heavy smoking, and sex. A higher incidence of yeasts was found in heavy smokers (those smoking more than 30 cigarettes daily). However, no significant change was recorded below this level. Alcohol decreased the incidence rate as the quantity of drink consumed increased. Excessive drinkers had a significantly lower incidence than the average.

71-1172. Miller, G. J., Ashcroft, M. T., Beadnell, H.M.S.G., Wagner, J. C., Pepys, J. **The Lipoid Pneumonia of Blackfat Tobacco Smokers in Guyana.** *Quarterly Journal of Medicine* 40(160):457-470, October 1971.

In Guyana, a large number of patients have been diagnosed as having a diffuse pulmonary fibrosis of unknown etiology, characterized by typical radiological appearances, dyspnea, cough, weight loss, and eventually pulmonary heart disease. Investigation of 56 patients showed that all had smoked a tobacco known as 'blackfat' or 'black tobacco.' In a community survey, 20.4 percent of the population aged 55 years and over smoked this tobacco. Altogether, 19.6 percent of the blackfat smokers but no non-blackfat smokers showed definite radiological evidence of pulmonary fibrosis. Smokers with, but not those without fibrosis, had severe airways obstruction. Immunological studies made it unlikely that an extrinsic allergic alveolitis had caused the radiological changes. Three post-mortem open-lung specimens were obtained and in each case the histology showed a diffuse interstitial fibrosis and vasculitis associated with large deposits of lipid surrounded by black amorphous material. Blackfat is a tobacco leaf to which mineral oil and vaseline are added for flavoring and as humectants. The presence of oil in the tobacco, and the post-mortem findings of oil in the lungs, indicate that the diffuse pulmonary fibrosis can be more accurately described as a lipoid pneumonia caused by the inhalation of mineral oils when blackfat is smoked. The potential health hazards of many tobacco additives, particularly oils, employed by the tobacco industry should be recognized. A similar type of disease as that found in Guyana may be present in other parts of the world where blackfat or related tobaccos are smoked. (Auth. Abs.)

71-1173. Morgan, W.K.C. **Coal Workers' Pneumoconiosis.** *American Industrial Hygiene Association Journal* 32(1):29-34, January 1971.

The medical indications of a specific pneumoconiosis resulting from inhalation of coal dust are presented. The characteristics of simple pneumoconiosis and of progressive massive fibrosis are discussed. The effects of cigarette smoking obscure and complicate the respiratory change induced by coal workers pneumoconiosis. The etiology of the disease is certainly associated with the inhalation of coal dust, therefore prevention of the disease can be achieved by control of such dust exposures. (Auth. Abs.)

71-1174. Morgan, W.K.C., Burgess D. B., Lapp, N. L., Seaton, A., Reger, R. B. **Hyperinflation of the Lungs in Coal Miners.** *Thorax* 26(5):585-590, September 1971.

The residual volume and total lung capacity of 1,455 working Pennsylvania coal miners were determined as part of a larger epidemiological study. The age of the subjects varied between 18 and 65 with a mean of 48.7 years. The total lung capacity of the subjects was determined from standard posteroanterior and lateral chest films while the forced vital capacity was determined by spirometry. The effect of increasing radiographic category of simple coal workers' pneumoconiosis on lung volumes was investigated. The residual volume increased with radiographic category; this occurred whether or not the miners had obstructive airways disease. The presence of obstruction had an additional effect over and above that due to coal dust alone, so that the largest increase in residual volume was found in miners who had both obstruction and radiographic evidence of simple coal workers' pneumoconiosis. Smoking had an additive effect and the highest residual volume ratios were in general present in the pneumoconiotic smokers. (Auth. Abs. Mod.)

71-1175. Naeye, R. L. **The Anthracotic Pneumoconioses.** *Current Topics in Pathology* 55:37-68, 1971.

A brief history of carbon-related pneumoconiosis is presented followed by a detailed discussion of the deposition and retention of anthracotic particles in the lung, and anthracosis related to graphite, carbon black, carbon electrodes, and tobacco and other commonly encountered air pollutants. Coal workers' pneumoconiosis is given special emphasis. The retention of the gaseous components from tobacco smoke has been shown to depend in part on their absorption on particulate components of the smoke. Cigarette smoke particles range from 0.1-0.5 microns in diameter and as they pass through the respiratory tract, they absorb moisture, thereby increasing their diameter to a size at which lung retention is maximal. The longer such particles are retained in the lung, the smaller the percentage of exhaled particles. The pulmonary deposition pattern of cigarette smoke particles is maximal at segmental airway bifurcations. Clearance of tobacco particles is slowed by components of the smoke that reduce ciliary activity, cause loss of ciliated cells, and reduce phagocytic activity of alveolar macrophages. The latter may be related to decreases in cellular oxidoreductase and hydrolase activities induced by the effects of smoke components on mitochondria. Macrophage output is increased in smokers but their bronchial clearance of bacteria may be reduced.

There is a modest effect of cigarette smoking on bronchitis and emphysema in coal workers' pneumoconiosis but some nonsmoking miners also develop these respiratory disorders. Many nonsmoking and smoking miners also chew tobacco or use snuff. These products sometimes contain pathogenic bacteria and nicotine can be absorbed from them. Miners smoke about as much as nonminers but the miners' consumption is confined to a short period each day since smoking is prohibited underground. Coal workers' pneumoconiosis is usually a disease of mixed etiology and additional research is needed to explore individual and combined effect of tobacco products, various mine dusts, trace elements, infection, and immunologic factors on the disease process.

71-1176. Owsinski, J., Janus, T., Mysik, M. **Wystepowanie Przewleklych Nieswoistych Chorob Ukladu Oddechowego (P.N.Ch.U.O.) Wsrod Pracownikow Zakladu Przemyslu Gipsowego "Dolina Nidy" w Gackach. [Occurrence of Chronic Unspecific Diseases of the Respiratory System Among Workers in the Plaster Works at "Dolina Nidy" in Gacki.]** *Przeglad Lekarski* 28(7):476-480, 1971, Polish.

A total of 343 workers in the Plaster Works at Gacki, including 285 men and 58 women, were examined. Of these, 149 worked in very dusty, 105 in moderately dusty, and 89 in slightly dusty conditions. Chronic bronchitis was found in 45.2 percent of those examined, obstructive bronchitis in 16.9 percent, and dyspnea in 22 percent. The occurrence of chronic unspecific respiratory diseases was three times higher in men than in women, and it was shown that smoking had a distinct influence on the frequency. Chronic bronchitis occurred in 21 percent of nonsmokers, in 34.5 percent of former smokers, and in 54.6 percent of actual smokers. The influence of dust, both as regards the amount and the length of employment, was clear in the groups of nonsmokers, former smokers, and recent light cigarette smokers, while in the group of those who had been smoking for over 10 years, the influence of smoking predominated, wiping out the differences caused by breathing in plaster dust. Frequent catarrhs of the upper respiratory tract were found in 22 percent of those examined. No cases of pneumoconiosis were found. (Auth. Abs.)

71-1177. Racoveanu, C., Manicatide, M., Nicolaescu, V. **Cercetari Epidemiologice Asupra Bronsitei Cronice in Doua Zone Fara Poluare Atmosferica Industriala. [Epidemiological Study of Chronic Bronchitis in Two Regions Without Industrial Air Pollution.]** *Studii si Cercetari de Medicina Interna* 12(4):359-367, 1971, Rumanian.

The incidence and prevalence of chronic bronchitis among the inhabitants of two regions free of industrial air pollution (Sf. Gheorghe in the Danube Delta and Fundata, North of Brasov) were studied. The investigation was carried out in two groups of 300 subjects each, by means of standard questionnaires, clinical examination, and respiratory function tests which included bronchial reactivity to acetylcholine. The incidence of chronic bronchitis was higher among the inhabitants of the mountainous region than among those in the Delta. The probable relationship between the higher incidence of chronic bronchitis in the mountain village and the bronchial reactivity also more marked in that region is discussed. Correlations are made between the incidence of chronic bronchitis, on the one hand, and the smoking habit and lung diseases of the last three years, on the other hand. Chronic bronchitis was present in 12.3 percent of the smokers of Fundata and in 1.4 percent of the nonsmokers. In the Delta, the percentages were 7.6 and 0.85, respectively. The prevalence of chronic bronchitis increased with the age of the smokers.

71-1178. Reichel, G. **Effect of Air Pollution on the Prevalence of Respiratory Diseases in West Germany.** In: Englund, H. M., Beery, W. T. (Editors). Proceedings of the Second International Clean Air Congress. Air Pollution Control Association. New York, Academic Press, 1971, pp. 186-191.

The results of an epidemiological field study of respiratory diseases in three West German districts (Duisburg, Bocholt, and the rural district of Borken) with different air-polluted environments are presented. The survey was conducted on a random sample of 8162 men and women. The sulfur dioxide levels in the three areas fluctuated between 0.03 and 0.3 ppm and the concentration of suspended particulates from 0.01 to 0.39 mg/m^3. There were no differences in prevalence of persistent cough and expectoration between men and women living in the three areas, if the groups were standardized for age, sex, smoking habits, and social conditions. There was no evidence that community air pollution in limited levels leads to an impairment of the mechanics of breathing and the gas exchange. Respiratory symptoms and lung function showed a strong relationship with age, smoking habit, and sex. Persistent cough and sputum production was higher in men and smokers particularly cigarette smokers, than in nonsmokers and women.

71-1179. Resnick, H., Lapp, N. L., Morgan, W.K.C. **Serum Trypsin Inhibitor Concentrations in Coal Miners With Respiratory Symptoms.** *Journal of the American Medical Association* 215(7):1101-1105, February 15, 1971.

The repeated demonstration of chronic obstructive airway disease in coal miners suggests the possible involvement of hereditary factors. Since the only known association between heredity and irreversible airway obstructive disease is related to alpha$_1$-antitrypsin inhibitors, the sera of a group of symptomatic coal miners were studied for antitryptic activity. No homozygous deficient subject was found in the group of coal miners studied. The distribution of trypsin inhibitor capacity suggests that a gaussian distribution provides a good fit to the data. Miners smoke slightly fewer cigarettes than nonminers, but since they are unable to smoke at work, they must smoke relatively more in their available leisure time. This intense cigarette smoke concentration in a shorter time may play a part in the increased prevalence of obstructive airway disease.

71-1180. Rylander, R. **Free Lung Cell Studies in Cigarette Smoke Inhalation Experiments.** *Scandinavian Journal of Respiratory Diseases* 52(2):121-128, 1971.

The number of free lung cells was studied in guinea-pigs using a modified lavage technique whereby the lung was repeatedly washed with the same fluid. Control experiments showed the wash-out efficiency was good.

When normal and SPF animals were compared, a lower number of macrophages with less deviation was found in the latter. The number of leukocytes was the same. Animals having received cigarette smoke showed a reduction of free lung cells, especially macrophages, after acute exposure. An increase was found in the number of macrophages after 2-4 weeks exposure. (Auth. Abs.)

71-1181. Shephard, R. J. **Atmospheric Pollution and Chronic Chest Disease.** *Canadian Family Physician* 17(11):39-44, November 1971.

Possible relationships between chronic bronchitis and air pollution are reviewed. Attention is drawn to the difference in incidence of chronic bronchitis between England and Canada, and the recent increase in mortality from respiratory diseases in Canada. Neither air pollution nor smoking habits can fully account for these phenomena. Methods of measuring pollution are described. It is concluded that Toronto is intrinsically as dirty as other cities of comparable size, and that although there have been substantial decreases of smoke over the past decade, levels of gaseous acid have shown little improvement. Urban/rural comparisons suggest that high concentrations of pollutants can double the prevalence of chronic bronchitis; however, the effect is much less obvious if comparisons are restricted to nonsmokers of comparable social status. Longitudinal surveys suggest a worsening of condition in bronchitics during periods of intense pollution. Justification for air pollution control programs lies more in the prevention of damage to buildings and beauty then in a specific effect upon human health. (Auth. Abs. Mod.)

71-1182. Simonsson, B. G. **Rokning och Andningsorganen. [Smoking and the Respiratory Organs.]** *Lakartidningen* 68(32):3581-3590, August 4, 1971, Swedish.

Smoking has been a custom in Sweden since about 1600 and cigarette consumption since 1850. Tobacco smoke contains both organic and inorganic constituents, is an aerosol containing 60 percent gas and 40 percent solids, and is always accompanied by droplets of liquid. Cigarette smoke with a pH below 7.0 is less irritating than the pipe or cigar smoke which has a pH above 7.0. The lungs are endowed with a natural cleansing system, but this is attacked by the gases. In a typical attack, a cell reaction is evoked which leads to damaged ciliated cells. Such damage in the large bronchi can lead to a metaplasia from the formation of atypical cells, thus causing cancer which is manifested by coughing and hemoptysis. This damage can also lead to emphysema, chronic bronchitis, and other afflictions. The disturbance of the lung function is ascertained on the basis of certain measurements. Thus a reflectoric bronchus constriction is measured as an increased airway resistance, and a lowered value of the diffusion capacity is found on the basis of the single-breath or steady-state CO method. All such changes affect the lung function, and the carcinogens in the tobacco smoke aggravate the situation as they create a basal cell hyperplasia which renders the person afflicted more prone to carcinoma.

71-1183. Stebbings, J. H. (Jr.) **Chronic Respiratory Disease Among Nonsmokers in Hagerstown, Maryland. IV. Effects of Urban Residence on Pulmonary Function Values.** *Environmental Research* 4(4):283-304, October 1971.

The effects of urban residence on prevalence of respiratory symptoms and on pulmonary function in a population of white male nonsmokers are presented. Residence in urban areas of 50,000+ population during childhood was positively related to the peak expiratory flow rate (PEFR); the effect at age 21 was estimated as approximately +26 l/min. Residence in urban areas during adult life showed a significant nonlinear relationship to PEFR. Values increased during the first seven years of urban residence as an adult, and then declined; this effect, at 30 years of urban residence after age 21, was estimated at −44 l/min. No effect on forced expiratory volume in one second was found. Results for the prevalence of cough and phlegm are consistent with the results for the PEFR, but numbers were too small to allow definite conclusions to be drawn. The variance about the regressions was studied, and it was discovered that social class and urban residence affected the relationship of the variance about the regression to the age of the respondents. (Auth. Abs.)

71-1184. Stevens, P. M., Hnilica, V. S., Johnson, P. C., Bell, R. L. **Pathophysiology of Hereditary Emphysema.** *Annals of Internal Medicine* 74(5):672-680, May 1971.

Patients with decreased serum alpha$_1$-antitrypsin were designated as severely deficient (7 to 15 percent of normal) or intermediately deficient (30 to 65 percent of normal) by quantitative radial immunodiffusion. All severely deficient patients were symptomatic and had severe emphysema. Among intermediately deficient patients emphysema was clinically evident only after age 50. Younger subjects had significant loss of lung elastic recoil and hyperinflation without expiratory flow obstruction. Older patients with an intermediate deficiency had abnormalities that were radiographically and physiologically identical to those of younger severely deficient patients. Postmortem examination of the lung of two patients with severe deficiency and one patient with intermediate deficiency showed extensive panlobular emphysema of the lower two-thirds of the lungs, with relative sparing of the upper third. It is concluded that patients with intermediate alpha$_1$-antitrypsin deficiency may develop emphysema identical to that found in severely deficient patients but at an older age. (Auth. Abs.)

71-1185. Valic, F., Zuskin, E. **A Comparative Study of Respiratory Function in Female Nonsmoking Cotton and Jute Workers.** *British Journal of Industrial Medicine* 28(4):364-368, 1971.

To compare the effect of cotton and jute dust, respiratory symptoms were studied and respiratory function measured in 60 cotton and 91 jute nonsmoking female workers of similar age distribution, similar length of exposure to dust, and exposed to similar respirable airborne dust concentrations. Cotton workers had a significantly higher prevalence of byssinosis, persistent cough, and dyspnea than jute workers. Among cotton workers, 28.3 percent were found to have characteristic symptoms of byssinosis, whereas none were found among jute workers. Exposure to cotton and also to jute dust caused significant reductions of forced expiratory volume in the first second, forced vital capacity, and peak expiratory flow over the first working shift in the week. Functional grading of jute and cotton dust effects has shown that about 30 percent of cotton workers had functional grades F1 and F2, while only 13 percent of jute workers were found in the same grades (F1). It is concluded that cotton dust may be considered more active than jute though the latter cannot be considered inactive. (Auth. Abs. Mod.)

71-1186. Walker, D. D., Archibald, R. M., Attfield, M. D. **Bronchitis in Men Employed in the Coke Industry.** *British Journal of Industrial Medicine* 28(4):358-363, October 1971.

An epidemiological survey to determine the prevalence of bronchitis in men employed at two of the National Coal Board's coking plants is described. Eight hundred and eighty-one men (91 percent) of the total working population were examined. A strong association was found between bronchitis prevalence and cigarette smoking. In addition, men who smoked and who were exposed to high temperatures, dust, and fumes in the environment of the coke-ovens had more bronchitis than men who worked elsewhere in the cokeworks. Both the presence of bronchitis and employment in the environment of the coke-ovens had significant and independent effects on ventilatory capacity. The combination of cigarette smoking and previous employment in a dusty industry also had a significant effect on ventilatory capacity. The investigation suggests that cigarette smoking, and the combination of smoking and pollution from the coke-ovens and previous occupation, appear to be important factors in the etiology of bronchitis and reduced ventilatory capacity in men employed in the coke manufacturing industry. (Auth. Abs. Mod.)

71-1187. Weiss, W. **Cigarette Smoking, Asbestos, and Pulmonary Fibrosis.** *American Review of Respiratory Disease* 104(2):223-227, August 1971.

A group of 100 asbestos textile workers was examined by chest roentgenogram and a questionnaire concerning age, sex, smoking habits, and duration of occupational exposure to asbestos. The roentgenograms were examined for evidences of pulmonary fibrosis without knowing the results of the questionnaire. Seventy-five workers were cigarette smokers and 25 were nonsmokers. The prevalence of pulmonary fibrosis was 40 percent in the smokers and 24 percent in the nonsmokers. The factors of age, sex, and duration of exposure to asbestos did not account for this difference. The prevalence of pulmonary fibrosis increased with increasing amount and duration of cigarette smoking and with increasing duration of exposure to asbestos. (Auth. Abs.)

See also, **71-1133, 71-1134, 71-1193**

71-1188. Weiss, W. **Survivorship Among Men With Bronchogenic Carcinoma. Three Studies in Populations Screened Every Six Months.** *Archives of Environmental Health* 22(1):168-173, January 1971.

Three prospective studies of lung cancer in older men are compared: the Philadelphia Pulmonary Neoplasm Research Project, the North West London study, and the South London study. Comparison of survival in men with lung cancer is difficult because of differences in methods, materials, and analyses. However, despite semiannual roentgenographic screening, the prognosis of lung cancer in older men remains poor. The results in London were slightly better than might be expected without screening. The results in Philadelphia were not as favorable. The differences were due primarily to the fact that the lung cancer patients in Philadelphia were older than those in London. The prognosis of lung cancer depends largely on factors other than "early" detection and therapy, such as age of the host, prevalence of concomitant chronic obstructive lung disease and pulmonary fibrosis associated with cigarette smoking, a factor common to lung cancer and such respiratory diseases. The vicious biologic character of bronchogenic carcinoma is its tendency to grow rapidly and metastasize before current methods can detect it. In view of the incontrovertible evidence that cigarette smoking is the major etiologic factor in this disease, effort to convince people to stop smoking is very important. The high cost of detection might be reduced by restricting screening to high-risk segments of the population, such as older men who are heavy cigarette smokers.

71-1189. Weissbecker, L., Creamer, R. M., Carpenter, R. D. **Cigarette Smoke and Tracheal Mucus Transport Rate. Isolation of Effect of Components of Smoke.** *American Review of Respiratory Disease* 104(2):182-187 August 1971.

Anesthetized cats were exposed to cigarette smoke gas phase of varied composition, and their tracheal mucus flow was measured in vivo. The composition of the gas phase was correlated with the change from pre-exposure mucus flow. Several compounds (isoprene, nitric oxide, and nitrogen dioxide) added in combination to cigarette smoke gas phase were effective in reducing the mucus flow compared with gas phase per se. Other compounds (methyl chloride, hydrogen, and carbon monoxide) diminished the mucostatic effect of cigarette smoke gas phase, with the rate approaching the mucus flow of the unexposed animal. Compounds that produced mucostasis per se were ineffective when added to cigarette smoke. An interaction between components of cigarette smoke and the mucous blanket was believed to exist. Even when compounds were added to saturate the actual sites of the mucus, complete stasis could not be achieved. (Auth. Abs.)

CARDIOVASCULAR DISEASES

71-1190. Banks, D. C., Raftery, E. B., Oram, S. **Clinical Significance of the Coronary Arteriogram.** *British Heart Journal* 33(6):863-870, November 1971.

A method of scoring the degree of obstruction of all three coronary arteries as revealed by coronary arteriography so that the disease process as a whole can be assessed is described. The score was correlated with the clinical details of 107 patients having ischemic heart disease, rheumatic heart disease, or both. Of those patients with a clinical history of myocardial infarction, 87 percent had complete, or almost complete, obstruction in one of the coronary arteries. Serum cholesterol level was related to the severity of the obstructive disease in the whole group even when the level remained within normal limits. There was no correlation between the total score and the length of history of angina pectoris or the number of cigarettes smoked. Patients with a history of congestive cardiac failure had a higher score than those without. No close correlation was found between the particular diseased artery and the area of myocardial damage as predicted from the ECG either at rest or on exercise. Neither the ECG nor clinical diagnosis of myocardial infarction, alone or together, correlated with complete obstruction on the arteriogram. (Auth. Abs. Mod.)

71-1191. Banks, D. C. **Smoking and Leucocyte-Counts. (Letter)** *Lancet* 2(7728):815, October 9, 1971.

A reduction in the total leucocyte-count was observed by the author upon cessation of smoking. The mean count decreased from 9123 to 7318. All counts were performed on venous blood taken at the same time of day, so that diurnal variation could not account for the differences. It thus appears that cessation of smoking can produce a reduction in the total leucocyte-count.

71-1192. Cassel, J. C. (Editor) **Evans County Cardiovascular and Cerebrovascular Epidemiologic Study.** *Archives of Internal Medicine* 128(6):883-986, December 1971.

A total of 17 articles in this issue of *Archives of Internal Medicine* report some of the findings from the Evans County Cardiovascular and Cerebrovascular Epidemiologic Study. A 1960 through 1962 prevalence study documented the fact that all manifestations of coronary heart disease occurred very rarely in black men, their age-adjusted rate being only one half that of white men. The Evans County Study has undertaken a full investigation of this observation, and of the various risk factors related to coronary heart disease, including cigarette smoking, blood pressure, serum cholesterol, and body weight. Although several factors need further exploration, it is suggested that the variations in the level of physical activity between the various ethnic and social class groups accounted, at least in part, for the difference in their rates.

71-1193. Cederlof, R., Epstein, F. H., Friberg, L. T., Hrubec, Z., Radford, E. P., (Editors) **Twin Registries in the Study of Chronic Disease With Particular Reference to the Relation of Smoking to Cardiovascular and Pulmonary Diseases.** *Acta Medica Scandinavica* (Supplementum 523) 1971, 40 pp.

For some years a program of research into the effects of tobacco on health has been carried out on Swedish and U.S. twin registries. The Swedish research in particular has been focused on cardiovascular and pulmonary effects of smoking. The methods used have included questionnaires clinical evaluations and mortality studies. An international symposium was held in San Juan, Puerto Rico, December 1-4, 1969,to evaluate how twin studies would compare with and supplement data from more commonly used epidemiologic investigations and to provide additional advise on the most effective use of available resources. Participants were asked to review previous work, to consider designs for new studies in twins, and to suggest methods for the effective conduct of these investigations. The recent work of the joint Swedish–U.S. twin studies had demonstrated the feasibility and unique value of epidemiologic studies on large samples of the only genetically identical individuals available in human populations–monozygotic twin sets. An additional advantage of studying monozygotic twins is that not only are both members of the set genetically identical but, even within smoking discordant sets, they tend to share a much more comparable environment than smokers and nonsmokers in general. Furthermore, data on dizygotic twins, although no more genetically similar than ordinary siblings, provide useful comparison groups matched for age, and sex, and with a tendency to have common environments.

71-1194. Ciampolini, E., Dringoli, R., Ravaioli P. **Azione del Fumo di Sigarette su Alcuni Parametri del Ricambio Lipidico. [Action of Cigarette Smoking on Several Parameters of Lipid Metabolism.]** *Atti dell'Accademia dei Fisiocritici in Siena; Sesione Medico-Fisica* 17:474-480, 1968, Italian.

The action of free fatty acids free glycerol total cholesterol, and glycerides has been studied in healthy young subjects of both sexes after smoking cigarettes. An increase in the concentrations of all the lipid fractions studied has been noted.

71-1195. Desplaces, A., Charreire J., Izard, C. **Action de la Phase Gazeuse de Fumee de Cigarette sur la Transformation Lymphoblastique du Petit Lymphocyte Humain (Observations Preliminaires). [Action of the Gas Phase of Cigarette Smoke on the Lymphoblastic Transformation of Small Human Lymphocytes (Preliminary Observations).]** *Revue Europeenne d'Etudes Cliniques et Biologiques* 16(8):822-826, October 1971, French.

The action of tobacco smoke on the blastic transformation of human small lymphocytes cultured in vitro with or without phytohemagglutinin was examined. Several doses of smoke were tested. In the presence of phytohemagglutinin, tobacco smoke inhibits small lymphocyte transformation, without phytohemagglutinin, it stimulates transformation. In both cases, the effect increased with the dose in the range studied. Further studies are in progress to determine the active substances in the smoke and whether they can be removed by filtration through activated charcoal. (Auth. Abs.)

71-1196. Duggan, J. J., Schiess, W. A., Hilfinger, M. F. (Jr.) **Unheeded Signals of Fatal Coronary Artery Disease.** *New York State Journal of Medicine* 71(22):2639-2642, November 15, 1971.

The incidence of warning chest pain in 110 victims of sudden death outside of the hospital was studied by interviewing their family or friends. Seventy-one victims had been known to have had heart disease. Nine men with no known symptoms died within one hour of the onset of chest pain. Three of these had high blood pressure, one had diabetes, and eight were cigarette smokers. The nonsmoker was a 74-year-old man with hypertension. Thirty victims had pain an hour or more before their death. Of 24 whose smoking habits were recorded, 20 smoked cigarettes, 1 smoked cigars, and another dipped snuff.

71-1197. Eastwood, M. R., Trevelyan, H. **Stress and Coronary Heart Disease** *Journal of Psychosomatic Research* 15(3):289-292, September 1971.

Stress, as measured by psychiatric disturbance, and its relationship to coronary heart disease was investigated in a group with psychiatric disorders (mostly chronic, mild, neurotic anxiety and depressive states) and a matched control group, each group containing 37 men and 87 women. The numbers with probable coronary heart disease were too small to test significance in different disease categories, but when the two categories were pooled there was, for each sex, a statistically significant excess of all coronary heart disease among the psychiatric group as compared with the control group. Men with presumed heart disease tended to smoke more tobacco daily and to have higher blood pressure, and those with a psychiatric disorder tended to have a higher psychiatric severity score than the rest of the psychiatric sample. Women with coronary heart disease were more obese, had higher blood pressure, serum cholesterol, and uric acid values, were more likely to have undergone menopause, and were less likely to be in full-time employment.

71-1198. Gilani, S. H. **Nicotine and Cardiogenesis. An Experimental Study.** *Pathologia et Microbiologia* 37(5):383-392, 1971.

The effects of nicotine on the cardiac development were studied in the chick embryos of 2-4 days of incubation. Hearts were observed to be smaller than normal with irregular beat. Circulation of the blood was slow and erratic. In most of the embryos, hematomas were prominent in the cephalic and heart regions. The following cardiac malformations were obtained: aortic stenosis (14 percent), common truncus arteriosus (5.7 percent), ventricular septal defects (10.3 percent), malformations of the aortic valve (12.3 percent) and pulmonic valve (10 percent). Other malformations included atrial septal defects (5 percent), thin atrial wall (6.3 percent) and thin ventricular wall (7 percent). No defects were found in controls. These studies have demonstrated that nicotine is toxic at the early stage of heart development and can lead to cardiac anomalies. (Auth. Abs.)

71-1199. Golovchiner, I. Y. **Nekotoryye Sotsial'nyye Faktory Zabolevayemosti Infarktom Miodarda. [Some Social Factors in the Incidence of Myocardial Infarct.]** *Zdravookhranenie Rossiiskoi Federatsii* 15(9):12-14, 1971, Russian.

Statistics on various social factors having a possible bearing on the incidence of myocardial infarct are presented. The data were gathered from an analysis of 530 myocardial infarct patients treated in Leningrad hospitals. The factors studied include age occupation, seasonal influences, domicile income, diet, paticipation in sports, time and method of travel to work, and the smoking and drinking habits Half (50.5 percent) of the smokers consumed an average of one pack of cigarettes per day, 18.3 percent more and 31.2 percent less than one pack of cigarettes per day. The 30-39 year age group contained the greatest percentage of smokers (82.3 percent). Over-all, 51.9 percent of the male patients were smokers and 21.1 percent ex-smokers. In female patients the corresponding ratios were 1.8 and 12.9 percent. Smoking and drinking were both seen as statistically significant factors in the development of myocardial infarct.

71-1200. Grannis, G. F. **Cigarettes and Heart Disease. (Letter)** *New England Journal of Medicine* 284(24):1384-1385, June 17, 1971.

This letter-to-the-editor criticizes C. C. Seltzer for his recent data which purported to show a poor correlation of secular changes in cigarette consumption with heart disease mortality rates. The kind of statistics used (percentage changes rather than absolute changes, and combined death rates of males and females rather than death rates of males) were inappropriate for evaluating this nonproportional, sex-related correlation. Seltzer discounted the major role of cigarette smoking in causing premature mortality of males, particularly from heart disease, and his choice of statistics confused an otherwise clear situation.

71-1201. Kjeldsen, K., Astrup, P., Wanstrup J. **Reversal of Rabbit Atheromatosis by Hyperoxia.** *Journal of Atherosclerosis Research* 10(2):173-178, September-October 1969.

Twenty-four rabbits were fed standard rabbit pellets plus 2-percent cholesterol. Twelve animals were exposed for 10 weeks to 28-percent oxygen (atmospheric air + oxygen) and 12 animals to 21-percent oxygen (atmospheric air). The degree of visible aortic atheromatosis and the aortic content of total cholesterol, phospholipids, and triglycerides were significantly lower in the hyperoxic rabbits. Microscopic examinations supported the macroscopic findings. (Auth. Abs.)

71-1202. Jenkins C. D. **Psychologic and Social Precursors of Coronary Disease.** *New England Journal of Medicine* 284(5):244-255, February 4, 1971.

An extensive literature review of the psychologic and social variables associated with the risk of coronary disease and the timing of its onset is presented. This first half of a two-part report organizes the wide diversity of empirical findings according to the following topics: recent review papers, sociologic indexes, social mobility and status incongruity, and anxiety and neuroticism.

71-1203. Keys, A. **Sucrose in the Diet and Coronary Heart Disease.** *Atherosclerosis* 14(2):193-202, September-October 1971.

The widely publicized theory that sucrose in the diet is a major factor in the development of coronary heart disease (CHD) is examined. The theory is not supported by acceptable clinical, epidemiological, theoretical, or experimental evidence. No relationship was found between the use of sugar and indications of CHD but there was a significant correlation between the use of sugar and the use of cigarettes. The nonsmoker averaged 83 grams of sugar daily while the average for the pack-a-day smokers was 103 grams. Claims that the theory is supported by international statistics, by the time trend of the incidence rate, by comparison of dietary habits of coronary patients and "controls," and by experiments were not justified by the actual evidence.

71-1204. Kornitzer, M., Demeester, M., Denolin, H. **Enquete Dans une Population d'Employes. Relation des Habitudes Tabagiques Avec d'Autres Parametres. [Investigation of a White-Collar Population. Relation of Tobacco Habits to Other Parameters.]** *Bruxelles Medical* 51(10):687-691, October 1971, French.

The relationship of the smoking habits of 539 male employees to three important risk factors for coronary disease was investigated. All were white-collar employees of a Brussel's bank and ranged in age from 40 to 59 years. Cigarette smokers had average lower systolic and diastolic arterial pressures than the nonsmokers and cigar or pipe smokers and the skin folds were also thinner in the cigarette smokers than in the other groups. Only minimal non-significant differences in blood lipid levels were found between cigarette smokers and the other groups. These results were in general agreement with the work of other investigators.

71-1205. Kozarevic, D., Pirc, B., Dawber, T. R., Kahn, H. A., Zukel, W. J. **Prevalence and Incidence of Coronary Disease in a Population Study. The Yugoslavia Cardiovascular Disease Study.** *Journal of Chronic Diseases* 24(7/8):495-505, September 1971.

A prospective study of the incidence of several manifestation of coronary heart disease (CHD) was undertaken in two Yugoslavian communities, Tuzla in Bosnia and Remetinec, a suburb of Zagreb in Croatia. Low rates of CHD prevalence and incidence were found in both communities. The low rates are associated with overall low levels of cholesterol and weight, but until the data are analyzed in more detail it cannot be determined if this is a causal or coincidental relationship. There was no evidence to suggest that subjects developing CHD smoked more cigarettes than those in the total population at risk. Because of similar reports of no relationship between smoking and mortality in Yugoslavian cohorts, it was thought worthwhile to instigate an inquiry as to physical and chemical differences between Yugoslavian and U.S. tobacco.

71-1206. Lundman, T., Liljefors, I., Cederlof, R., Friberg, L. **The Validity of Questionnaire Diagnosis. "Angina Pectoris."** *Archives of Environmental Health* 22(5):597-599, May 1971.

Validation of a mailed questionnaire concerning angina pectoris has been performed using 69 male twins with the diagnosis "angina pectoris" according to the questionnaire. Of these, 22 percent could be verified at the clinical examination. If all clinically suspected cases were included together with the cases with a pathological electrocardiogram (ECG) the confirmation rate was 57 percent. The confirmation rate was higher, but not significantly so, if the criteria for angina pectoris were altered so that only those with central chest pain were included. The frequency of pathological ECGs in cases with a clinical diagnosis of angina pectoris was significantly higher than in those with a questionnaire diagnosis, which indicates that the validity of the clinical diagnosis is greater. The results indicate that the questionnaire is very useful for screening cases with coronary heart disease. If it is used at prevalence studies or effect studies, one has to be aware of the relatively high frequency of false-positives. (Auth. Abs.)

71-1207. Medical Journal of Australia. **Is Smoking Teratogenic?** *Medical Journal of Australia* 2(13):644, September 25, 1971.

A follow-up of the survivors of the 1958 British Perinatal Mortality Study has led to a reconsideration of the role of maternal smoking as a cause of congenital heart disease. Approximately 92 percent of these seven-year-old children were traced and a medical history taken. The analysis was restricted to single births, and cases of congenital heart disease associated with anencephalus, spina bifida, or Down's syndrome were excluded. There remained 290 cases of congenital heart disease, mostly fatal, and in 39.7 percent of these, the mother had smoked after the fourth month of pregnancy. Even after allowing for the effects of maternal age, maternal parity, and social class, the effect of smoking was still significant. The small number of cases of each particular deformity made it difficult to determine whether any specific defects were particularly associated with smoking, although this may be true of patent ductus arteriosus and Fallot's tetralogy.

71-1208. Mittal, S. R. **A Clinical Review of Thrombo-Angitis Obliterans.** *Indian Practitioner* 24(4):217-224, April 1971.

Seven cases of peripheral vascular disease were divided into two groups. The first included five males, ages 18-48, of low socioeconomic status, all of whom were heavy smokers. They showed either normal or low blood pressure, and the absence of peripheral pulse. Femoral and popliteal pulsations were normal in almost all cases. The second group included a 52-year-old smoking male and a 65-year-old nonsmoking female, both of middle class, who showed high blood pressure and involvement of peripheral vessels and femoral and popliteal pulsations. On the basis of these observations, the clinical entity thromboangiitis obliterans should be used for cases resembling those in the first group and arteriosclerosis obliterans for cases similar to the second group.

71-1209. Paffenbarger, R. S. (Jr.), Wing, A. L. **Chronic Disease in Former College Students. XI. Early Precursors of Nonfatal Stroke.** *American Journal of Epidemiology* 94(6):524-530, December 1971.

Doctor-diagnosed stroke was reported by 102 of 10,327 men who had attended Harvard University, 1916-1940, and who had returned a usable, self-administered mail questionnaire in 1966. A 67-percent response was achieved from a single mailing and the reliability and validity of answers were found to be generally acceptable. The mean age of subjects was 54 years at time of stroke occurrence, while the mean age of respondents ranged from 64 for the five earliest college classes to 47 for the five most recent classes. Examination of university medical records of these former students revealed four characteristics in youth that predisposed to increased incidence of nonfatal stroke in later life: higher levels of blood pressure, increased weight for height, shorter body stature, and cigarette smoking. Paired combinations of any of the four characteristics had an additive or greater effect on stroke incidence. Similarly, questionnaire responses in 1966 from these former students revealed four highrisk characteristics that associated with an increased prevalence of nonfatal stroke: high blood pressure, coronary heart disease, diabetes, and a history of parental hypertension. High blood pressure exerted the strongest influence on prevalence of nonfatal stroke, both singly and when paired with the three other characteristics. High blood pressure in the former students and a history of parental high blood pressure, both determined by questionnaire, were each better predictors of nonfatal stroke than higher levels of blood pressure assessed in college. (Auth. Abs.)

71-1210. Pandey, M. R. **Myocardial Infarction in Nepal.** *Indian Heart Journal* 22(2):73-82, April 1970.

Of 150 cases of myocardial infarction reported during the 1960-1968 period in Nepal, 66.6 percent occurred in the 41-60 age group, 74.6 percent occurred in the high income group, and 65.3 percent occurred in moderate and heavy smokers. The disease affected males 6½ times more than females. Hypertension, diabetes, gout, and hypercholesterolemia significantly increased the risk of infarction. Arrhythmia was the most common complication followed by left ventricular failure, right ventricular failure, shock, and thromboembolism.

71-1211. Singh, A. P., Singh, S. P. **Coronary Heart Disease–Some Epidemiological, Clinical and Electrocardiographic Observations.** *Journal of the Association of Physicians of India* 19(9):629-635, September 1971.

Some epidemiological and clinical aspects of coronary heart disease were analyzed in 240 cases with emphasis on the role of various risk factors. There was a marked preponderance of the disease in males in the 51-60 age group. Altogether, 37.91 percent of the patients were smokers; 27.91 percent chewed tobacco. From 20 to 25 percent of the patients were moderate and heavy smokers of long duration and many both smoked and chewed tobacco. Excess of saturated fat in the diet, hypertension, and diabetes were considered to be significant predisposing factors, while smoking, obesity, and syphilis were not significant. Some 40 percent of the patients were cultivators and manual laborers and 15.47 percent gave positive family histories of coronary heart disease. Pain was the predominant symptom. Infarction and ischemic changes occurred in 49.16 and 38.75 percent, respectively.

71-1212. Tibblin, G., Wilhelmsen, L. **Ateroskleros–Nikotinsyraterapi (1): Hjartinfarktens Riskfaktorer. [Atherosclerosis–Nicotine Therapy (1): Heart Infarct Risk Factors.]** *Lakartidningen* 68(15):1738-1743, April 7, 1971, Swedish.

The population of this Swedish study was classified by sex, blood lipids, age, pulse rate, blood pressure, smoking, and physical activity. Risk factors for an infarct include cholesterol, triglycerides, blood pressure, pulse rate, smoking, stress, and sedentary occupation. Smokers belong to the high-risk group and the chance of their developing a heart infarct or cerebrovascular disease is 17.9 percent whereas in the low-risk group this value is 1.2 percent. It is difficult to assign to smoking alone the role of culprit when, for example, a hyperlipemia is also induced by alcohol consumption. To establish the host-illness-disease relationship, both etiological and psychological factors which affect the development of any such syndromes must be considered.

71-1213. Wray, R., DePalma, R. G., Hubay, C. H. **Late Occlusion of Aortofemoral Bypass Grafts: Influence of Cigarette Smoking.** *Surgery* 70(6):969-973, December 1971.

A series of 100 patients undergoing aortic reconstruction for aneurysmal or aortoiliac occlusive disease during the period 1965 to 1968 was studied. The striking clinical observation in this study is the constant association of cigarette smoking and late occlusion of aortofemoral reconstruction for occlusive disease. This association was not observed in patients operated upon for aneurysm. The contribution of cigarette smoking to decreased peripheral blood flow may, under normal circumstances be inconsequential. When superimposed upon progressive obstructive atherosclerosis, it may assume major proportions decreasing already compromised flow through a prosthesis and allowing thrombosis to occur. Individuals with peripheral atherosclerosis who continue to smoke have a higher amputation rate than those who relinquish the habit. Since smokers with aortofemoral reconstruction appear to be more liable to late thrombic complications involving the graft, cessation of cigarette smoking is recommended to all patients undergoing vascular reconstruction.

71-1214. Wright, H. B. **Casualties of Middle Age.** *Public Health* 85(6):326-332, September 1971.

Causes of death among middle-aged men are briefly examined with particular emphasis on coronary heart disease. Risk factors involved in coronary heart disease, such as obesity, cigarette smoking, high cholesterol levels, and high blood pressure, are discussed. The use of screening programs to identify high-risk individuals, advising patients to stop smoking, and other preventive measures are mentioned.

71-1215. Zacho, A., Nielsen, J., Larsen, V. **Smoking Habits of Patients With Pernicious Anaemia in Whom Gastric Cancer Has Not Been Demonstrated.** *Acta Chirurgica Scandinavica* 137:541-545, 1971.

A questionnaire survey was made of the smoking habits of 93 patients with pernicious anemia. In the age group of 70 years and over there were fewer smokers than in the general population. Within the entire group there were fewer who had ever smoked than in a group of patients with gastric cancer. A large proportion of the original smokers had stopped smoking or had reduced their smoking before pernicious anemia was diagnosed, the majority because it no longer tasted good. After the treatment was instituted only a few quit or reduced their smoking. Achlorhydria and lack of intrinsic factor are compatible with heavy smoking. Some of the intolerance symptoms in smoking may be due directly or indirectly to the lack of vitamin B_{12} and may be an early sign of pernicious anemia. Gastric cancer was not detected in any of the patients with pernicious anemia.

See also, **71-1134, 71-1237**

OTHER DISEASES AND CONDITIONS

71-1216. Alp, M. H., Hislop, I. G., Grant, A. K. **Gastric Ulcer in South Australia, 1954-1963. 2. Symptomatology and Response to Treatment.** *Medical Journal of Australia* 1(7):372-374, February 13, 1971.

A retrospective study of chronic gastric ulcer has been carried out on 638 patients over the 10-year period 1954 to 1963. There was no difference in symptomatology between ulcers of the body of the stomach and antral ulcers. Associated duodenal ulceration was more common in patients with antral ulcers, while in females antral ulcers were more liable to perforation. Hemorrhage occurred more frequently from ulcers in the body of the stomach. In 202 of 274 patients, assessed after three or more weeks of medical treatment, the ulcer had healed. Eighty-seven percent of the patients whose ulcer recurred had continued to smoke, drink alcohol, or ingest aspirin, but so had 49 percent of those whose ulcer remained healed. (Auth. Abs.)

71-1217. Dixon, G. **Advances in Obstetrics and Gynaecology.** *Practitioner* 207(1240):433-441, October 1971.

The results of various studies on the risk to the offspring of mothers who smoke during pregnancy are reviewed. These findings show a low birth weight, retarded growth at all gestational stages, and death associated with growth retardation in these babies. Children of mothers who smoked more than 10 cigarettes daily after the 4th month of pregnancy were 4 months retarded in reading at the age of 7. Although there is a lowered incidence of pre-eclampsia in smoking mothers, the risk to the baby increases if the mother who develops pre-eclampsia also smokes. In addition, babies of smoking mothers are more likely to abort, to be stillborn, to die neonatally, or to have congenital heart disease. New advances in obstetrics and gynecology are discussed, including intra-uterine detection of genetic disorders, the active management of labor, contraceptive techniques, sterilization, the effects of the 1967 Abortion Act, the effects of certain drugs on pregnant women, immunization, and cryosurgery.

71-1218. Gilder, S.S.B. **Cigarettes and Gastric Secretion.** *Canadian Medical Association Journal* 104(9):758, May 8, 1971.

The effect of smoking three cigarettes in one hour on the gastric secretion of 12 healthy volunteers (both smokers and nonsmokers) was studied. The overall effect of smoking on acid output was negligible, although one subject showed a 30-percent stimulation and another 30-percent inhibition through smoking. Apart from the fact that the person with increased acid response also had an increase in pepsin output, the effect of smoking on the latter was negligible.

71-1219. Goldstein, H. **Factors Influencing the Height of Seven Year Old Children–Results From the National Child Development Study.** *Human Biology* 43(1):93-111, February 1971.

The heights of the children in the National Child Development Study (all children born in England, Scotland, and Wales during the week of March 3-9, 1958) have been measured between seven and eight years of age. Information was also obtained on the social class of the child's father, the age and height of the child's mother, her smoking habits during pregnancy, the parity, birthweight and length of gestation of the child, and the number of younger siblings. The associations of these variables with height were analyzed both singly and jointly, in all cases making allowance for the age and sex of the child. No evidence of statistical interactions between sex and any of these variables was found. After allowing for the other variables, first born children are, on average, 2.3 cm taller than fourth or later born children, and those children with no younger siblings are 1.1 cm taller than those with three or more. Birthweight and length of gestation are both associated with height at seven years. The average gain in height for each kilogram of birthweight is 2.8 cm. Children born before the 38th week of gestation are on average 1.1 cm shorter than those born between 38 and 42 weeks. When all the other variables are allowed for, the gestation effect becomes non-significant; but the average gain in height for each kilogram of birthweight is only slightly reduced, being 2.1 cm. The correlation coefficient between the height of the mother and the height of the child is 0.33 for boys and 0.32 for girls, with a standard error of 0.013 in both cases. The average gain in height for each cm of mother's height is 0.27 cm, after allowing for the other variables. Children of mothers who were under 25 years old when the child was born, after allowing for the other variables are on average 0.6 cm smaller than the children of mothers aged 25 or over. After allowing for the other variables, the children of mothers who smoked 10 or more cigarettes a day after the 4th month of pregnancy, are on average about 1.0 cm shorter at age seven than the children of mothers who did not smoke. (Auth. Abs. Mod.)

71-1220. Hosko, M. J. **The Effect of Carbon Monoxide on the Visual Evoked Response in Man. And the Spontaneous Electroencephalogram.** *Archives of Environmental Health* 21(2):174-180, August 1970.

Human volunteers were exposed to carbon monoxide at concentrations ranging from 1 to 1,000 ppm for 0.50 to 24 hours. Carboxyhemoglobin levels greater than 20 percent produced changes in the visual evoked response similar to those previously described in animals. The amplitude of the 2-3-4 wave complex was increased and was accompanied by a negative-going shift in the 5a-6 waves. Carboxyhemoglobin levels approaching 33 percent did not alter gross spontaneous electroencephalographic activity. (Auth. Abs.)

71-1221. Konturek, S. J., Radecki, T., Thor, P., Dembinski, A., Jacobson, E. D. **Effects of Nicotine on Gastric Secretion and Ulcer Formation in Cats.** *Proceedings of the Society for Experimental Biology and Medicine* 138(2):674-677, November 1971.

Nicotine infused intravenously in doses corresponding to the nicotine absorbed by smoking 4 to 8 cigarettes/hr failed to alter basal and pentagastrin-induced gastric acid secretion in conscious cats with gastric fistulas. In these doses, nicotine exhibited a potentiating effect on pentagastrin-induced peptic ulcer formation, probably due to its interference with the neutralization of acid in the duodenum. (Auth. Abs.)

71-1222. Kueppers, F. **Identification of the Heterozygous State for the Alpha$_1$-Antitrypsin Deficiency Gene in Man.** *Biochemical Genetics* 3(3):283-288, 1969.

Alpha$_1$-antitrypsin of individuals homozygous for a gene determining low serum concentrations of this protein can be distinguished electrophoretically from alpha$_1$-antitrypsin of homozygotes for the more common gene. Heterozygotes possess both electrophoretic species, and they may have alpha$_1$-antitrypsin levels intermediate between those of both homozygotes or may be in the range of the homozygotes for the common gene. The frequency of the gene determining a deficiency of alpha$_1$-antitrypsin in a population sample of 100 individuals was 0.075. (Auth. Abs.)

71-1223. Laugier, P., Extermann, J. C., Micheau C., Reiffers, J. **L'Ouranite Glandulaire. [Papular Leukokeratosis of the Palate.]** *Dermatologica* 142(6):344-352, 1971, French.

The designation 'ouranite glandulaire' is preferrable to that of 'leukokeratosis' because the latter term describes a lesion which is secondary to the essential glandular lesion. The disease primarily affects the palatine salivary glands, particularly those of heavy smokers and those of persons smoking menthol cigarettes or sucking large amounts of mentholated candy. Histological and clinical descriptions are presented based on 14 cases studied. Prognosis is considered good, and treatment consists of suppressing the irritating causal factor.

71-1224. Marks, E., Swiecicki, W. **Wplyw Tlenku Wegla, Wibracji i Obnizonego Cisnienia Atmosferycznego na Mozgowy Uklad Neurosekrecyjny i Poziom Aminokatecholi. [Effect of Carbon Monoxide, Vibration and Lowered Atmospheric Pressure on the Cerebral Neurosecretory System and Catecholamine Levels.]** *Medycyna Pracy* 22(3):335-342, 1971, Polish.

The effects of carbon monoxide, lowered atmospheric pressure, and vibration on the cerebral neurosecretory system and catecholamine level in blood of rats were investigated. Carbon monoxide and lowered atmospheric pressure produced a decrease in the amount of neurosecretion in the nucleus of the thalamus and neural part of the hypophysis. Vibration resulted in a significant increase in catecholamine levels.

71-1225. Morales, A., Silva, S., Alcalde, J., Waissbluth, J., Ramos, J., Bey, H., Sanz, R. **Cigarrillo y Secrecion Gastrica. I. Analisis de la Secrecion Gastrica en Pacientes Digestivos Fumadores y No Fumadores. [Cigarettes and Gastric Secretion. I. Analysis of Gastric Secretion in Smoking and Nonsmoking Ulcer Patients.]** *Revista Medica de Chile* 99(4):271-274, April 1971, Spanish.

A study of 231 patients of both sexes suffering from gastric or duodenal ulcer demonstrated some differences in gastric acid secretion between smokers and nonsmokers. Significantly higher levels of baseline acid output were found among the male smokers with duodenal ulcer. Average post-histamine acid output was higher in males smokers with gastric ulcer. The smoker/nonsmoker ratio in patients with duodenal or gastric ulcer was greater than that of a control group composed of 81 individuals with other digestive disorders. Acid production did not correlate with age, sex, site of ulceration, or duration and intensity of the smoking habit.

71-1226. Morales, A., Silva, S., Osorio, G., Alcalde, J., Waissbluth, J. **Cigarrillo y Secrecion Gastrica. II. Efecto del Cigarrillo Sobre la Secrecion Gastrica. [Cigarettes and Gastric Secretion. II. Effect of Cigarettes on Gastric**

Secretion.] *Revista Medica de Chile* 99(4):275-279, April 1971, Spanish.

The effects of smoking cigarettes on the volume of gastric secretion, and the hydrochloric acid concentration and loss from gastric secretion were investigated in individuals with and without ulcers. The two groups were studied both in the absence of stimulation and after subcutaneous or intravenous infusion of histamine. No significant variations in volume or output of gastric acid were detected while smoking during the non-stimulus experiments. Smoking during histamine stimulation provoked transient decreases in gastric secetion which lasted approxiamtely 15 minutes after the end of inhalation. These changes were not detected when gastric secretion was determined as volume/hour or output/hour after stimulation. Individual variations with respect to gastric secretory activity after cigarette smoking occurred in both ulcer and non-ulcer patients.

71-1227. Ochsner, A. **Influence of Smoking on Sexuality and Pregnancy.** *Medical Aspects of Human Sexuality* 5(11):78,79,83,84,88,89,92, November 1971.

Various studies on the adverse effects of smoking during pregnancy report increases in the rate of abortion, stillbirth, prematurity, neonatal deaths, and low birth weight in infants of smoking mothers. Smoking produces the deliterious changes in the fetus by decreasing placental circulation which retards growth by decreasing nutrients to the fetus. Carboxyhemoglobin levels were higher, respiration was depressed, and peripheral cyanosis remained longer in infants whose mothers smoked. Similar results were found in studies on offspring of animals exposed to cigarette smoke or nicotine injections. There is some evidence that the degree of morphologic masculinity is a factor in the incidence of smoking. A study of smokers matched with nonsmokers according to age, sex, race, and social level found that smokers marry more often, move more frequently, change jobs more often, are hospitalized more often, and participate in more sports. Smokers were also found to be consistently more neurotic than nonsmokers. Great differences were also found between personalities of smokers and nonsmokers. Several case histories are briefly described which illustrate that discontinuance of tobacco results in an increase in libido.

71-1228. Pettersson, F. **Smoking in Pregnancy. Retrospective Study of the Influence of Some Factors on Birth Weight.** *Acta Socio-Medica Scandinavica* 1:13-18, 1969.

In a retrospective study of birth weight in 3782 children born to women questioned about smoking habits during pregnancy, it was found that children born to nonsmoking women weighed 100 g more than children born to smoking women. In the analysis performed with multiple regression analysis there was also taken into account the age of the mother, pregnancy order, marital status, socioeconomic group, previous pregnancy experience, length of pregnancy, sex of the child, place of home, and alcohol habits. (Auth. Abs.)

71-1229. Pincherle, G. **Obesity and Smoking Habits. (Letter)** *British Medical Journal* 4(5782):298, October 30, 1971.

Data from the Institute of Directors Medical Centre are presented refuting previously reported findings by Khosla and Lowe on obesity and smoking habits. No convincing weight differences between smokers and nonsmokers were found. The author argues that social class must be taken into consideration in obesity studies because heavy smoking, heavy drinking, and overeating may be part of a syndrome of general overindulgence. The increased financial opportunities for this type of behavior occurring in upper class patients may account for the lack of differences in relative weight found between nonsmokers and heavy smokers. The author also reports that out of 222 men who had given up smoking at follow-up a year or more after their first visit, 50 percent had the same weight (± 5 lb), 28 percent had gained weight, and 22 percent had lost weight.

71-1230. Primrose, T., Higgins, A. **A Study in Human Antepartum Nutrition.** *Journal of Reproductive Medicine* 7(6):257-264, December 1971.

A method of dietetic management on the pregnant woman is presented with emphasis on augmenting protein-intake according to a predetermined general standard. This method is feasible for use in public clinics used by the most deprived socioeconomic section of a large metropolitan city. The results demonstrate that this method can produce full-term babies of superior birthweight in a high percentage of cases. Generally recommended maternal weight gain standards are not applicable and if held at too low a level, may actually harm the baby. The risk to the baby also exists if the mother's pre-pregnancy weight was five percent or more below her average group weight. Babies born to mothers in this study had lower neonatal morbidity and mortality than those born to mothers not in the study. The birth weight for infants of mothers who smoked was less even though the calorie intake of the mother was greater on this diet. There was a lower incidence of toxemia and other diseases of pregnancy and the mothers delivered their babies easier with a higher percentage of spontaneous deliveries and fewer cesarean sections.

71-1231. Suomi, J. D. **Prevention and Control of Periodontal Disease.** *Journal of the American Dental Association* 83(6):1271-1287, December 1971.

There is sufficient evidence that keeping the teeth clean is effective in controlling periodontal disease. Toothbrushing is the method most commonly recommended for removal of deposits of oral debris and plaque from the teeth. At least two daily brushings are recommended. Dentifrices are useful for cleansing the teeth, but the overzealous use of dentrifices with strong abrasives is contraindicated especially if softer portions of teeth are exposed. No one particular kind of toothbrush should be recommended for use by all persons. Dentists should advise their patients to receive prophylaxes at a frequency consistent with the rapidity with which deposits are seen to form and with the patient's oral hygiene habits and periodontal condition. The evidence indicates that occlusal trauma does not initiate gingivitis or pocket formation, therefore, prophylactic grinding of teeth should be done selectively. No systemic factors that initiate periodontal disease in the absence of local irritants have been identified. There is some evidence that diabetes and pregnancy may predispose to periodontal disease. Available data are inadequate to prove a beneficial effect of systemic fluorides in preventing or reducing periodontal disease. Since there have been conflicting reports concerning the association of tobacco consumption with periodontal disease, further research is needed in this area. Diet is apparently not an important consideration in the causation or prevention of periodontal disease.

See also, **71-1130, 71-1134, 71-1150, 71-1207, 71-1215**

BEHAVIORAL AND EDUCATIONAL RESEARCH

71-1232. Akgun, N., Durusoy, F., Kocaturk, E. **Lise Ogrencilerinde Sigara Kullanimi. [Smoking Habits Among Lycee Students.]** *Ege Universitesi Tip Fakultesi Mecmuasi* 10(1):15-21, 1971, Turkish.

The smoking attitudes and habits of 5564 students (3881 boys and 1683 girls) aged between 12 and 23 from seven lycees located in Izmir, Turkey were surveyed by means of a questionnaire. The results showed that 21 percent of the boys and 24 percent of the girls were smokers. Among the male smokers, 67 percent were regular and 33 percent were occasional smokers; among the girls, 25 percent were regular and 75 percent were occasional smokers. The majority of the smokers (42 percent of the boys and 74 percent of the girls) smoked 1-5 cigarettes per day. About 16 percent of the boys and 3 percent of the girls smoked 16-20 cigarettes per day; none of the girls and a very small number of boys smoked more than 20 cigarettes per day. In general, the students began to smoke between 14 and 16 years of age. Boys tended to smoke more heavily than girls. The students, especially the girls, preferred filter-tipped cigarettes. The reasons for first smoking were curiosity, the influence of friends, adaptation to social environment, relief of anxiety, and the influence of physicians or a member of the family. Of the regular smokers, 59 percent of the boys and 94 percent of the girls had knowledge of the harmful effects of smoking, 35 percent of the boys and 77 percent of the girls enjoyed smoking, and 60 percent of the boys and 70 percent of the girls inhaled deeply. In comparison with the findings for similar populations, the percentage of smokers among the students was not as high as that of other countries. Prophylactic measures against the hazards of smoking should include close cooperation among the student, family, teacher, and physician.

71-1233. Battig, K. **Personlichkeitsaspekte und subjektive Einstellungen bei Rauchern und Nichtrauchern, Abstinenten und Alkoholkonsumenten. [Personality Aspects and Subjective Attitudes in Smokers and Nonsmokers, Abstainers and Alcohol Consumers.]** *Zeitschrift fur Praventivmedizin* 16:409-410, 1971, German.

The study is based on the interrogation of 415 students (346 males, 69 females) of both Zurich universities. Responses to 50 questions on alcohol and tobacco consumption, social status, geographic location, and subjective attitudes on current political problems were recorded. The subjects were also tested, with the 100 musical selections of Cattell's IPAT-Music Preference Test of Personality. About 50 percent of the subjects were nonsmokers, dark cigarettes were preferred by the smokers, sex differences were small, and the significance threshold was exceeded only in the data as cigar and pipe smoking. A significant correlation was found between alcohol and tobacco consumption. Regular alcohol and cigarette consumption was correlated with socially critical attitudes regarding church, state, and sexual mores, The belief in an injurious effect of smoking was strongly correlated with conservative-traditional attitudes regarding politics, church, and state. The music test revealed a clear divergence in the mean values of individual factors between abstainers and alcohol users and between smokers and nonsmokers.

71-1234. Bernholm, B. **David och Goliat. [David and Goliath.]** *Socialmedicinsk Tidskrift* 2(Special No.):103-105, February 1971, Swedish.

The effect of the daily press upon the smoking habit is compared to the story of David and Goliath. David represents the text information furnished by a newspaper about the bad effects of smoking and Goliath represents the attractive advertisements which the cigarette manufacturers place in the same newspaper. The six largest Swedish newspapers and 13 weekly publications contain 1300 advertisements in favor of tobacco smoking, and 150 articles providing correct information on the evils of smoking which ought to have had a restrictive effect. The reader often has the attitude, "smoke first, ask later." He tries to find in the correctly reported article which describes the noxious effects of tobacco something similar to what he is accustomed to seeing in the ads. A well-known Swedish advertisement is described in which a prince woos and wins a beautiful young maiden with a cigarette in the mouth. Such advertisements can be combated only by showing them to be ridiculous.

71-1235. Brody, S., Rybo, G. **Rokning och Logik. [Smoking and Logic.] (Letter)** *Lakartidningen* 68(12):1302-1303, March 17, 1971, Swedish.

Anything said for or against smoking has value only if the causal relationship is clearly established. A published article about smoking must furnish explanations, arguments, and present a debate, not merely dictate an opinion. A statement such as "smoking should be prohibited" is meaningless since it is necessary to define clearly first of all who is issuing the prohibition and, secondly, who shall enforce any such restriction on smoking. Should the enforcer be the ombudsman, the board of directors of a hospital, the Public Health Administration, the Social Security authorities, the local government, or the national government? Statements which are not identified as to issuing or enforcement authorities are simply categorical imperative statements which are used as a safety valve.

71-1236. Creswell, W. H. (Jr.), Stone, D. B., Huffman, W. J., Newman, I. M. **Antismoking Education Study at the University of Illinois.** *HSMHA Health Reports* 86(6):565-576, June 1971.

The first phase of the University of Illinois antismoking study was a modified replication of an earlier study in Portland, Oregon. Results from the first of three surveys of the Winnebago County (Illinois) school population, 7th through 12th grades, tended to concur with findings from previous studies on the behavior of youthful smokers. While findings for the overall rate of smoking by youth in the Illinois study were similar to those of earlier studies, certain differences were revealed. The early adolescent girl was smoking at a considerably higher rate than her counterpart of 10 years ago. A higher rate also was observed for ninth grade boys, but the difference was not as pronounced as for girls. Baseline data obtained from the initial survey served as a reference point for evaluating a series of continuing and related studies and as the information necessary for effecting a comparative analysis with the mass communication experiment of the Portland study. The Illinois experiment indicated that the contemporary message theme (immediate effects of smoking) was most effective in reducing the rate by which youth take up smoking. In contrast, the remote message theme was found to be most effective in Portland. In addition to the comparison studies, 12 separate but related studies were also completed. Among these investigations were the development of test instruments, educational materials, classroom teaching-learning experiments, and prospective surveys designed to test the predictability of selected factors in relation to future smoking behavior. (Auth. Abs.)

71-1237. Dalhamn, T. **Fram for Saklighet i Rokdebatten! [Objectivity in Debates About Smoking! (Letter)]** *Lakartidningen* 68(19):2198-2200, May 5, 1971, Swedish.

The general public is exposed to heavy smoking as well as to antismoking advertising in radio and television commercials, in which no clearcut difference is made between the smoking of cigarettes and of cigars and pipes. The presentation of numerical values in such advertising is highly desirable. Thus, in the U.S. for nonsmokers between 45 and 64 years of age the mortality is 708 per 100,000, whereas for smokers this value rises to 1329 per 100,000. The diseases most affected by smoking are bronchial carcinomas and cardiac and vascular diseases. For 100,000 persons of the same age range, the incidence of bronchial cancer is 11 cases for nonsmokers and 87 for smokers. The corresponding values for cardiac diseases are 422 and 802, respectively. Any comparison of cigarette smoking with cigar and/or pipe smoking generally lacks objectivity. The cigarette smoker has a personality completely different from the cigar smoker. The latter often abstains from alcohol, but enjoys overeating. The deleterious effect of smoking cannot be equated in the case of a cigarette chain smoker when compared to a person who puffs on one cigar for a prolonged period.

71-1238. Estes, J. W., Johnson, M. **Relationships Among Medical and Nonmedical Uses of Pharmacologically Active Agents.** *Clinical Pharmacology and Therapeutics* 12(6):883-888, November-December 1971.

Psychoactive drug use was admitted by 14 percent of 328 high school students (a 22 percent sample) in a small suburban New England town. Marihuana was used by 75 percent of those who used drugs at least once, followed by the barbiturates (28 percent), the hallucinogens (25 percent), and the amphetamines (23 percent). Eighty-seven percent of the students had ingested alcohol at least once. One third of the students surveyed smoked. Of the smokers, 1 in 5 smokes rarely, 1 in 5 smokes a pack a day, and 1 in 12 smokes more than a pack a day. The incidence of smoking was about 40 percent in grades 8 through 11, but it fell to 23 percent among seniors. Parental drinking and smoking habits were not related to whether or not the students used drugs, alcohol, or cigarettes. There were no sex differences in use of drugs, alcohol, or tobacco, although the boys became intoxicated more often. Drug users were more likely to use alcohol and tobacco. The incidence of drug abuse was found to be significantly related to the frequency of aspirin ingestion among the students.

71-1239. Frankenhaeuser, M., Myrsten, A.-L., Post B., Johansson, G. **Behavioural and Physiological Effects of Cigarette Smoking in a Monotonous Situation.** *Psychopharmacologia* 22(1):1-7, October 20, 1971.

Sustained performance in a visual reaction time test was examined in 12 moderate smokers. In a control condition without smoking, efficiency decreased over time. In a condition, where three cigarettes were smoked at 20-minute intervals, the subjects were able to maintain their initial level of performance throughout the session, mean reaction times being significantly shorter in the smoking than in the control condition. Smoking produced a significant increase in adrenaline excretion and heart rate. (Auth. Abs.)

71-1240. Fry, J. N. **Personality Variables and Cigarette Brand Choice.** *Journal of Marketing Research* 8:298-304, August 1971.

An investigation of relationships between personality dispositions and brand choice is reported. Attention is given to determining the attributes which differentiate brands and to choosing brands for study that differ substantially in these attributes. Personality and socioeconomic measures are cast in the role of both moderator and predictor variables. The results justify a more optimistic view of the use of personality variables for understanding brand choice than is currently apparent in the literature.

71-1241. Golli, V. **Studiu Asupra Obiceiului de a Fuma. [Study of the Smoking Habit.]** *Igiena* 20(3):167-178, 1971, Rumanian.

A survey of the over-age-15 population of a suburban district of Craiova showed that 33.27 percent of the males and 4.34 percent of the females were smokers. Among males the percentage of smokers was 26.78 percent under

30 years of age, 44.22 percent in the 31-40 age group, and 32.7 percent over age 40. Among females, the percentage of smokers was 2.16 percent under the age of 30, 5.28 percent in the 31-40 age group, and 5.57 percent over age 40. In general, the number of smokers fell with age. More than half the men began smoking before they were 20 years old, 34.7 percent between the ages of 21 and 30, and 12 percent after age 30, whereas 22.9 percent of the women started smoking before the age of 20, 38.5 percent between the ages of 21 and 30, and 38.6 percent after age 30. Altogether, 16.3 percent of the males and 4.3 percent of the females smoked over 20 cigarettes a day. The average number of cigarettes smoked annually was 6310 for men and 4480 for women. Psychological and social investigations are needed to determine why youth start smoking in order to control scientifically the smoking problem. The increased incidence of smoking related diseases such as coronary thrombosis, lung cancer, and chronic bronchitis ought to trigger a sustained campaign against smoking, especially among the younger generation.

71-1242. Haglund, S. **Attitydteoriernas Roll vid Matning av Informationseffekt. [The Role of Attitude Theories in Measuring the Effect of Information.]** *Socialmedicinsk Tidskrift* 2(Special No.):105-107, February 1971, Swedish.

In the case of smoking, it is shown how information received must be correctly weighed and weighted before answers received from a questionnaire on smoking can serve as a basis for drawing conclusions. A questionnaire respondent answering "I smoke a lot" could give this answer in the same spirit as he would when stating "I own a blue Volkswagen". But he could have the attitude that smoking improves one's virility and in this case his answer would imply "I am very masculine." There is a discrepancy between answers such as "I smoke a lot" and "I know that smoking causes cancer of the lungs." In such replies one must evaluate the degree of conviction so as to find out how much of an ego-defensive attitude the answer contains. Social values play their role in such answers since the party answering wishes either to identify with his surroundings or to show the contrast. His answer serves as a baseline, showing the degree of acceptance of smoking. An answer may imply that "one should be on the lookout for a healthier smoking habit", but it could also imply "one should not change this habit". Behavorial attitudes gleaned from a smoking questionnaire must be judiciously evaluated for personal bias.

71-1243. Harefuah. **Seqer 'Al Hergele 'Ishun Ben Rof'im Weliqho. [An Investigation of the Smoking Habits Among Israeli Physicians and Its Implications.]** *Harefuah* 80(3):156-157, February 1, 1971, Hebrew.

A number of surveys concerning the smoking habits of physicians in various countries are reviewed. These surveys show that nonsmokers total 45.8 percent of the physicians and 34.2 percent of the nurses in Canada, 70 percent of the physicians in Great Britain, 76 percent of the physicians in Massachusetts, and 73 percent of the physicians in Israel. These findings demonstrate that physicians are convinced of the hazards of smoking. The most important practical problem concerning smoking is how to convince young people not to begin the habit. One important step is to ban cigarette advertising in all modes of mass media, including smoking by television performers and high government officials.

71-1244. Hill, D. **Peer Group Conformity in Adolescent Smoking and Its Relationship to Affiliation and Autonomy Needs.** *Australian Journal of Psychology* 23(2):189-199, August 1971.

The role of peer group conformity in adolescent cigarette smoking was investigated in children attending a rural high school. Analysis of questionnaire responses and sociometric data showed homogeneity among members of sociometric groups for both smoking behavior and smoking attitudes. A subsequent experimental manipulation provided evidence that the "peer group conformity" motive can be instrumental in changing the attitudes of adolescents. Subjects informed that their previous responses deviated from their own friendship groups' norms tended to change their opinions in the direction of the bogus norms. More or less conforming subjects were identified in advance on the basis of appropriate combinations of high and low affiliation and autonomy needs. (Auth. Abs.)

71-1245. Huttner, I., Huttner, H. **Die Motivation des Gesundheitsverhaltens. Teil 4. [Motivation in Health Behavior. Part 4.]** *Zeitschrift fur Aerztliche Fortbildung* 64(12):634-642, June 15, 1970, German.

Human behavior has an increasing influence on health. The problem consists in internalizing a stable behavior for health. For this, it is important to know the motives which control this behavior. In the present work, which is a completion of earlier presentations, a motivation model is developed and then tested in a pilot study. The model is in the form of a hypothesis matrix based on the assumption that motives are basically externally determined, but internally these motives depend on the hierarchical requirements of the individual. In all, 13 motives are defined. Their dependence was hypothetically formulated and tested. Special attention was directed to an economic sample. The final sample was based on three initial samples (nutrition, the smoking habit, and engagement in sports). The resulting errors were taken into account and the hypotheses of the motivation model verified. The needs and requirements for health education are summarized.

71-1246. Jacobs, M. A., Spilken, A. Z. **Personality Patterns Associated With Heavy Cigarette Smoking in Male College Students.** *Journal of Consulting and Clinical Psychology* 37(3):428-432, December 1971.

Male heavy cigarette smokers were hypothesized to evidence (a) personality traits of defiance, impulsivity, and danger seeking; (b) oral preoccupations; (c) manifest distress; and (d) perception of having experienced minimal warmth, protection, and affection while growing up. Both self-rating scales and projective techniques were utilized to test the assumptions. On all measures, the heavy smokers scored significantly higher than did the nonsmokers. These results were interpreted as support for the view that although people smoke for a variety of reasons, the habituated or addicted smoker often engages in the practice as an extension of his personal style and utilizes it to deal with characterologic as well as situational aspects of his life which may engender tension, irritation, or boredom. (Auth. Abs.)

71-1247. Lindstrom B., Tibblin, G. **Personlighetsdrag–Rokning. En Pilotstudie. [Personality Features in Smoking. A Pilot Study.]** *Socialmedicinsk Tidskrift* 2(Special No.):85-87, February 1971, Swedish.

Of 973 men invited to participate in a 1963 Gotesburg, Sweden study, 855 or 88 percent of them complied. Based on their smoking habits, these men were divided into several groups, and each group was evaluated psychologically. An assessment was made of such factors as: how strongly they would stick to a principle, how strongly they would retain their habits, to what degree they would feel bound by rules, and how impulsive they were. Heavy cigarette smokers showed a weaker personality, were inclined to asthenia, and tired easily. Statistics are provided for pipe smokers and light, moderate, and heavy cigarette smokers.

71-1248. Meares, R., Grimwade, J., Bickley, M., Wood, C. **Smoking and Neuroticism. (Letter)** *Lancet* 2(7727):770-771, October 2, 1971.

Data are presented which are contrary to those published by Eastwood and Trevelyan concerning the existance of a relationship between smoking and neuroticism. Neuroticism was studied in a group of 102 smoking and 102 nonsmoking women who were attending an antenatal clinic and who were also asked about their smoking habits. An attempt to divide the smoking group into light and heavy smokers was abandoned as only seven women smoked more than 20 cigarettes a day. The mean neuroticism score of the nonsmokers was 11.67 (standard deviation 4.59) compared with 13.34 (s.d. 5.10) for the smokers. The difference was found to be significant using the unpaired t-test. This study also confirmed a previous report that extraversion and smoking are associated. Mean scores on Eysenck's extraversion scale were, for nonsmokers 10.08 (s.d. 3.3), and for smokers 11.27 (s.d. 3.72). This difference was also significant. Possible methodological reasons for the differences between the two studies are briefly discussed.

71-1249. Misfeld, J., Timm, J. **Trendanalysen zum Problem des Verbrauches an Nikotin und Rauchkondensat in der Bundesrepublik Deutschland fur die Jahre 1961-1970. [Trend Analysis in the Problem of the Consumption of Nicotine and Smoke Condensate in the Federal Republic of Germany From 1961-1970.]** *Beitrage zur Tabakforschung* 6(1):51-55, July 1971, German.

On the basis of numerous research results and data on the development of nicotine and condensate contents of German cigarettes, their respective shares in the market, the smoked length of cigarettes, and the per capita consumption of cigarettes in the Federal Republic of Germany, an estimate has been prepared on the yearly per capita consumption of smoke condensate and nicotine in the Federal Republic covering the years 1961-1970. The values for 1961 amount to 40.2 g of smoke condensate (crude) and to 2.04 g of nicotine. The values for 1970 are only 29.4 g and 1.63 g, respectively. This means that the consumption of smoke condensate and nicotine in the Federal Republic has decreased during the last ten years. The number of smokers having remained almost the same, the consumption of smoke condensate and nicotine per smoker has decreased by about 27 percent and 20 percent, respectively, during the years between 1961 and 1970 despite an increased cigarette consumption. (Auth. Abs.)

71-1250. Newman, I. M., Irwin, R., Ang, J., Smith, J. M. **Adolescent Cigarette Smoking in Two Societies.** *International Journal of Health Education* 14(3):114-120, 1971.

A total of 353 matched pairs of New Zealand and U.S. cigarette smokers were compared on the basis of a number of descriptive characteristics to ascertain the nature of adolescent cigarette smoking in the two societies. The results indicated that New Zealand females smoked more cigarettes than did U.S. females, while males in both societies smoked about the same number. New Zealand students, both males and females, tended to select filter-tipped cigarettes more often than U.S. students. New Zealand smokers of both sexes had smoked for a longer time than U.S. smokers. Compared to U.S. students, more New Zealand males planned to reduce their smoking habit, while more New Zealand females indicated that they wished they had never started smoking but did not plan to stop. Significantly more New Zealand male smokers had fathers who smoked than did U.S. male smokers. New Zealand parents were more likely to forbid smoking by young people than were U.S. parents and more U.S. parents expressed attitudes indicating disinterest in their young people's smoking behavior than did New Zealand parents. New Zealand adolescents were more likely to smoke in the presence of their parents than were U.S. smokers. Attention is drawn to the danger of a superficial educational approach to the smoking problem, as the smoking act among adolescents has an important function as a mechanism for overtly exhibiting independence.

71-1251. Nilsson, A., Tibbling, L. **Personlighetsskillnader Mellan Rokare Med Olika Cigarettkonsumtion. [Personality Differences Among Smokers With Different Cigarette Consumptions.]** *Socialmedicinsk Tidskrift* 2(Special No.):87-90, February 1971, Swedish.

Persons who smoked about 20 cigarettes a day were tested under conditions of stress and were classified as hypersensitive, desensitive, sensitive, and hyposensitive, measured on the basis of oculogyral illusions and color-word tests. Clearcut differences were found. Only two out of 17 heavy smokers had no neurotic signs in the personality test, whereas 10 out of 16 moderate smokers did show these signs. These differences become more apparent when smokers of less than 13 cigarettes daily were compared with those smoking more than 20.

71-1252. Pincherle, G., Williamson, J. **Smoking and Neuroticism. (Letter)** *Lancet* 2(7731):981, October 30, 1971.

Support is given for the observed relationship between cigarette smoking and psychiatric state. Heavy smoking

(20 or more cigarettes a day) was found to be more common in patients judged by the examining doctor to be under excessive stress, than in non-stressed patients. There was no difference between those stressed from work and those stressed from their home circumstances.

71-1253. Piper, G. W., Jones, J. A., Matthews, V. L. **The Saskatoon Smoking Study–Results of the First Year.** *Canadian Journal of Public Health* 62(5):432-441, September-October 1971.

The Saskatoon Smoking Study is a continuing study of the smoking habits of students in a particular area and the effect on smoking behavior of a student-directed program in antismoking education. This portion of the study discusses changes in smoking behavior in Grades VII and VIII students before and after various educational projects. These included a seminar on smoking and health attended by student opinion leaders and completion of a self-administered questionnaire on smoking and health by all students. (Auth. Abs.)

71-1254. Ramstrom, L. M. **Nagra Informationstekniska Synpunkter. [Some Viewpoints on Information Technology.]** *Socialmedicinsk Tidskrift* 2(Special No.):97-100, February 1971, Swedish.

In regard to advertisements directed against the use of tobacco, the correct way of disseminating information is discussed. The Swedish National Union for Explaining Damage due to Tobacco, first furnishes a communication to a larger organization (e.g., a chain of newspapers) which in turn provides the channel (a full-page ad), which subsequently affects the party for whom it is intended (a smoking schoolboy). The effectiveness of the ad can be determined by feedback from the schoolboy to the Swedish National Union. Each individual party in this information chain is of importance and the channel must contain information which creates an opinion. The schoolboy forms this opinion, accepts it as valid, and prevails upon the other students in his class to accept his opinion and to stop smoking. The opinion formed is a selective one and it must lead to a positive action on the part of the schoolboy. Otherwise, the whole communication is worthless. It was found that of students from the 4th to the 9th grade who were exposed to such advertisements, 12 percent of them stopped smoking, and a considerable number did not start. There were significantly fewer "starters" than there would have been if such advertisements had not appeared.

71-1255. Resnick, J. H. **Modification of Smoking Behavior: Good Designs–Inaccurate Reporting.** *Journal of Consulting and Clinical Psychology* 37(3):323, December 1971.

The importance of accurately reporting aspects of methodology in a replication and extension study is discussed. Methodological difficulties in doing research on smoking are sufficient by themselves so that care should be taken to avoid reporting nonexistent ones. (Auth. Abs.)

71-1256. Stang, H. J. **Bruk/Misbruk av Euforiserende Stoffer Blant Utskrivningspliktige ved Oslo-Sesjonene 1969. [Use/Abuse of Euphoriants Among Conscripted Youth at the 1969 Oslo Session.]** *Tidsskrift for Den Norske Laegeforening* 90(16):1549-1556, August 15, 1971, Norwegian.

Persons registering for the draft show certain habits (smoking of tobacco and marijuana) which they acquired in school or at home. Twenty draftees were interviewed daily from January 30 to April 29, 1969. A total of 210 were rejected for service in the Armed Forces, 7 of which were narcotic addicts. The remainder were questioned as to the reasons why they smoked marijuana, or used opiates, and the answers were tabulated according to age, place of birth, broken home environment, model set by parents, schooling, and work done. Special attention was paid to simultaneous use or abuse of alcohol and tobacco. The non-marijuana smokers, as a rule, drank alcohol sporadically, but 22 percent of the smokers used alcohol daily. Of the marijuana smokers, 80 percent also smoked tobacco, whereas only half of the non-marijuana smokers smoked ordinary tobacco products daily. Altogether, 141 (8.3 percent) of the draftees had past experiences with marijuana between the ages of 14 and 18; 3.4 percent had used it from one to five times, and 23 percent more than six times. Of these, 6 percent were dependent upon marijuana.

71-1257. Vuori, H., Himanen, P., Hanninen, J., Jarvinen, M., Rantanen, T. **The Smoking Habits of Finnish Physicians.** *International Journal of Health Education* 14(2):68-74, 1971.

The smoking habits of a sample of 1067 Finnish physicians were investigated by means of a mailed questionnaire. Forty-four percent of the 843 respondents had never smoked, 23 percent had stopped smoking, 10 percent smoked irregularly, and 23 percent regularly. For male physicians, these figures are considerably lower than those of the general male population whereas female physicians smoke as much or even more than the general female population. Among the younger physicians, there is a clear tendency to stop smoking or not to start at all. There are no differences between the representatives of different medical specialities with regard to frequency of smoking, changes in smoking behavior, and reasons for stopping smoking. From the point of view of health education, it seems that the great majority of physicians are aware of, and acknowledge, the health hazard of smoking. Efforts should be concentrated on making those physicians who still smoke show a good example by stopping smoking and making all physicians aware of their opportunities and responsibility in antismoking activities. (Auth. Abs.)

71-1258. Wirsen, C. **TV:s Roll i Informationen. [TV's Role in Information.]** *Socialmedicinsk Tidskrift* 2(Special No.):100-103, February 1971, Swedish.

The information on smoking disseminated by television was evaluated for a large segment of the Swedish population. The television messages impress the listener in direct proportion to their increased objectivity. The listener will accept a message as objective if it agrees with his opinions and education. Facts which differ must be sold to the listening audience by presenting the right approach. Television conveys information in such a way that the listener sees himself in a kind of electronic mirror. Only after much experimentation directed toward the desired message to be conveyed, can the television program act as a psychopharmacological agent to combat smoking. The listener easily gets into a rut and has to be manipulated. The government now forces the manufacturer to put a warning on the cigarette package which the listener sees when the various brands are portrayed on the television screen and advertised by enhancing words. The antismoking message will be successful if the television message works upon the emotions because the facts in themselves do not influence the listener as strongly.

71-1259. Yarom, D., Lerer, T. **Seqer Hergele 'Ishun Beqerev Harof'im Beyisra'el. [A Survey of Smoking Habits Among Physicians in Israel.]** *Harefuah* 80(3):150-151, February 1, 1971, Hebrew.

This random representative sample shows that 27 percent of Israeli physicians regularly smoke cigarettes as compared to 40 percent among the general population, and that 30 percent are ex-smokers. Two-thirds of the ex-smokers stopped within the past ten years, the period when most reports on smoking hazards were published. Of those still smoking, 62 percent want to quit and two-thirds of these have tried. Most of the unsuccessful attempts involved those smoking 11 years and longer. Almost half of the smokers continue to smoke because of habit alone, one-third because smoking gives them pleasure, and 19 percent to relax. Those not counted as regular smokers and those who smoke five or fewer cigarettes per day claim to smoke mostly during tension or social occasions. The number of cigarettes smoked by physicians per day are comparable with findings among the general population. Most physicians agree that they should set an example for the public by not smoking, that cigarette smoking should be combated, and that this can best be done through education and mass media.

See also, **71-1262, 71-1264, 71-1265, 71-1266**

TOBACCO ECONOMICS

71-1260. Menhart, F., Richter, R., Toussaint, J. **Modell zur Bedarfsvorhersage fur Tabakwaren nach Preisklassen mit Hilfe der Trendrechnung. [Model for the Prediction of Demand for Tobacco Products by Price Class With the Aid of Trend Calculation.]** *Lebensmittel-Industrie* 18(6):227-229, 1971, German.

A model is described for the prediction of demand for differently priced tobacco products. Because of the lack of suitable data from retail sources, its development has been calculated from a combination of the turnover trends observed in industry and in the wholesale trade. For calculating the trend, a method with variable prediction function is outlined which permits selection of the appropriate curve from an entire series of curves, and which corresponds to the appropriate trend.

SMOKING CESSATION METHODS

71-1261. Best, J. A., Steffy, R. A. **Smoking Modification Procedures Tailored to Subject Characteristics.** *Behavior Therapy* 2(2):177-191, April 1971.

Explanations of treatment were devised to capitalize on the individual differences of smoking clinic clientele volunteering for a standard aversive conditioning treatment. The experimental design permitted study of the interactions of specially tailored explanations and the individual difference dimensions from which the commentaries were derived. The primary goal of the study was to contrast the utility of an internalized "willpower"–oriented approach to smoking control with an externalized environment-based approach to self-control and to analyze the relative worth of these procedures for clients falling at the high and low end of the Rotter Locus of Control (LOC) scale. Also, procedures designed to induce dissonance gave an opportunity to test the application of a dissonance model; and, in post hoc analyses, to study the interaction of the dissonance-inducing procedure with pretreatment levels of dissonance as measured by Keutzer's Effective Cognitive Dissonance (ECD) scale. The results failed to show promise for the control manipulation or its interaction with LOC scores, but the dissonance procedure alone and in interaction with the ECD scores produced positive findings. It was noticed that greater levels of induced dissonance produced greater reductions in smoking, and that the best improvements occurred in subjects with high natural dissonance scores who received the low dissonance procedures, and low dissonance score subjects who received the strong dissonance induction. (Auth. Abs.)

71-1262. Jacobs, M. A., Spilken, A. Z., Norman, M. M., Wohlberg, G. W., Knapp, P. H. **Interaction of Personality and Treatment Conditions Associated With Success in a Smoking Control Program.** *Psychosomatic Medicine* 33(6):545-556, November-December 1971.

A total of 104 men who were heavy smokers (minimum of a pack, and averaging 35 cigarettes a day) participated in a 10-week program to break the habit. The majority (N=83) received group therapy, and the remainder were seen individually. Each subject was randomly assigned to one of the following drug conditions: no pills, placebo, lobeline, dextroamphetamine, and imipramine. Pretesting established each subject as a good (N=67) or poor (N=37) risk to stop smoking. Results indicated that, both at the end of treatment and at followup 3 months later, group was superior to individual therapy, treatment without drugs was more effective than taking medication (especially for high-risk cases), and low-risk did better than high-risk subjects. Successful subjects stayed in treatment longer than did failures. Relapse was associated with life situations and loneliness, passivity, boredom, tension, and personal tragedy. The best predictor of resistance to relapse was the abrupt and complete breaking of the habit during the first two weeks of the program ("cold turkey"). (Auth. Abs.)

71-1263. Levinson, B. L., Shapiro, D., Schwartz, G. E., Tursky, B. **Smoking Elimination by Gradual Reduction.** *Behavior Therapy* 2(4):477-487, October 1971.

Two methods of gradual reduction in smoking over a 12-week period were compared. The first required subjects to smoke at pre-set random times using a signalling device. The second allowed subjects to smoke at times of their choice using a mechanical counter to self-regulate their daily smoking quota. Each method was tested with and without group meetings. More subjects in the counter groups finished the program; however, groups using the signalling device were more successful in eliminating smoking at the time of a 3-month follow-up. The use of the signalling device was associated with a tendency to reduce the effects of situational cues on smoking, and group meetings seemed to raise morale among participants. The greatest difficulty in further smoking reduction occurred at the 12-14 cigarettes per day level for all groups. It was hypothesized that, despite the decrease in learned cues, further reduction is inhibited by the manifestation of withdrawal symptoms caused by some physiological addiction. These results suggest that a successful smoking elimination program should combine psychological and physiological approaches. (Auth. Abs.)

71-1264. Luban-Plozza, B. **Nikotin und Gesundheitsfuhrung. [Nicotine and Health Behavior.]** *Monatskurse fur die Arztliche Fortbildung* 20(12):1-6, 1970, German.

Required information for physicians dealing with the problems of tobacco detoxification is presented. As an introduction, the report discusses the conditions for the absolute and relative contraindications for smoking, reasons for juvenile smoking, and the reasons for, and drives in, pleasure and compulsive smoking. The different methods currently employed for detoxification are then discussed. These include non-drug methods such as reliance on will-power alone, the substitution of sweets, chewing gum, etc., a method which can work quite well with occasional or pleasure smokers, and the use of physiotherapy, especially when the lungs are heavily stressed. A recommended course of breathing exercises is outlined. Other non-drug methods include autogenous training, hypnosis, and psychotherapy. Psychotherapy requires an analysis of the motives of the individual wishing to discontinue smoking. The "Magic Mountain" atmosphere of a treatment center is conducive for such purposes. Lobeline and non-lobeline products are currently utilized in drug-assisted detoxification. Such drugs are most effective when combined with psychotherapy. Detoxification also works best when physicians and parents are nonsmokers. A questionnaire for background data on the smoking habits of a smoking clinic candidate is included in the report.

71-1265. Markiewicz, K. **Niektore Aspekty Leczenia Farmakologicznego Przewleklego Nikotynizmu. [Some Aspects of Pharmacological Treatment of Chronic Nicotinism.]** *Polski Tygodnik Lekarski* 26(20):767-769, May 17, 1971, Polish.

A chronic nicotine addict is one who smokes 20 cigarettes a day, or about 7300 cigarettes per year. Various drugs (lobeline, methylphenidate, Diazepam, and others) used to break the chronic tobacco habit are surveyed. None of these drugs are free from side effects. While taking lobeline, the patient gradually decreases his nicotine intake. For a certain period of time he is under the action of both alkaloids, which gives rise to a lobeline-nicotine syndrome. Lobeline prompts a release of serotonin, whereas tobacco smoking causes the release of 5-hydroxytryptamine, with the result that the patient actually has to fight more toxins for a time. Lobeline administration should be accompanied by psychiatric treatment. In such a combination therapy, 250 heavy smokers were treated from two to four weeks with lobeline. Altogether, 70 percent of these showed partial or complete abstinence. Other drugs are not as effective as lobeline. For instance, of 23 patients treated from four to eight weeks with Atarax, only one ceased smoking. Amphetamine given in doses of 10 mg can bring about a lowering of the tobacco intake by 50 percent. Other methods are based on the chemical destruction of nicotine such as treating the smoke with potassium permanganate or silver nitrate before it reaches the mouth. Patients in these cases complain of a number of symptoms (dryness of the mouth and a foul taste). Smoking can be reliably stopped only if orders issued to this effect are rigidly enforced.

71-1266. Miller, A., Gimpl, M. **Operant Conditioning and Self-Control of Smoking and Studying.** *Journal of Genetic Psychology* 119(2):181-186, December 1971.

Three treatment conditions were compared for their effectiveness in reducing smoking rates and increasing study time for 43 volunteers. The treatments were as follows: recording responses, self-instructions, and reinforcement for conforming to self-instructions. All subjects recorded responses the first week for a baseline and gave self-instructions the second week for modifying their rate of responding. In the third week smokers were separated into three groups, and nonstudiers were separated into comparable groups. For smoking an analysis of variance yielded significant decreases in smoking rate across weeks, but no significant differences among treatment groups. For studying an analysis of variance yielded significant increase in studying across weeks and interaction effects of treatments over weeks. The reinforcement condition produced the greatest increase. (Auth. Abs.)

GENERAL

71-1267. Orr, R. G. **Smoking-Withdrawal Clinics. (Letter)** *New England Journal of Medicine* 285(24):1384, December 9, 1971.

The two-year follow-up results of an antismoking clinic in which 198 individuals were treated by means of personal encouragement and hypnosis were success, 28 percent, partial success, 14 percent, failure, 40 percent, and withdrawals, 18 percent. These results were very similar to the six-month results.

GENERAL

71-1268. British Medical Journal. **World Action on Smoking.** *British Medical Journal* 4(5779):65, October 9, 1971.

At the Second World Conference on Smoking and Health it was noted that the 6 percent decline in cigarette consumption after publication of the second report of the Royal College of Physicians had been maintained. Efforts to ban cigarette advertising in Great Britain, Norway, and Canada were discussed, along with the problem of less harmful forms of smoking. A recommendation was made that smokers smoke less, take fewer puffs, use only the first half of the cigarette, and inhale as little as possible. It was shown that filters and lower tar and nicotine content of cigarettes had reduced the lung cancer rate. It was pointed out that carbon monoxide from cigarette smoke may be more important than nicotine in relation to coronary disease.

71-1269. Jenkins, R. W. (Jr.), Chavis, M. K., Newman, R. H., Morrell, F. A. **The Quantitative Recovery of Smoke From Radioactively Labeled Cigarettes.** *International Journal of Applied Radiation and Isotopes* 22(11):691-697, November 1971.

A smoking machine is described which gives quantitative recovery of the various smoke phases, i.e. sidestream, mainstream, butt, and ash. Carbon-14 compounds are used as tracers to measure the recovery. The average recovery was 100 percent. Complicated transfer of smoke fractions is eliminated, thus reducing the time needed per analysis. Instrumentation is described for the display of actual puff volume taken during smoking. Data for the distribution of ^{14}C-nicotine and ^{14}C-dotriacontane-16,17 added to cigarettes are presented. (Auth. Abs.)

71-1270. Taylor, W.J.R. **History and Pharmacology of Psychedelic Drugs.** *Internationale Zeitschrift fur Klinische Pharmakologie, Therapie und Toxikologie* 5(1):51-57, August 1971.

Cannabis or marijuana is a very ancient compound that was used by the Chinese for scores of centuries. Presently, it is estimated that there are 8 million users in the United States. Untold generations of American Indians have used mescaline in the form of peyote cactus buttons to alter consciousness. More recently, lysergic acid diethylamide (LSD), which was first synthesized in 1938, became a significant part of the "psychedelic scene". Amphetamines or "pep pills" are also aggravating the current drug abuse problem. Organic solvents, anesthetics, and household spices can be used to produce psychotropic effects. "Glue sniffing" has great potential for serious damage to the liver, kidney, and central nervous system. Cocaine abuse is probably a much greater problem in this country than is generally realized. Alcohol, caffeine, and nicotine are socially acceptable pharmacological psychedelics which are causing physical dependence in millions of Americans. Little is known about the clinical pharmacology of most mood-altering chemicals and too little is being done to learn more. A drug "credibility gap" is being created between the generations and physicians are contributing by making public statements before all the facts are known. (Auth. Abs. Mod.)

71-1271. WHO Chronicle. **The Limitation of Smoking.** *WHO Chronicle* 25(10):452-457, October 1971.

Highlights from a report submitted by the Director General of the World Health Organization to the 24th World Health Assembly are presented. Recommendations included the organization of a control program and the passage of legislation to require warning notices on cigarette packets, to restrict smoking in public places, to encourage the manufacture of less harmful cigarettes by differential taxation, to increase taxation on cigarettes and to restrict advertising. All WHO Member States were called upon to give all possible consideration to putting these recommendations into effect.

See also, **71-1134**

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